

Journal of the National Association of Document Examiners

Volume 30, Summer 2011

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Editorial

by

Jacqueline A. Joseph, BA, CDE, D-BFDE

Serving the truth and offering our knowledge and experience via the justice system combine to form the theme in this edition of the NADE Journal. The contributing authors bring to light our responsibility to be effective communicators in courtrooms, on video, and in the pages of the professional literature.

The 2011 edition opens with guest author and NADE Honorary Life member, the Honorable Paul J. De Muniz, Chief Justice of the Oregon Supreme Court, offering a captivating portrayal of what document examiners will appreciate as a pivotal moment in the history of our profession. As the author puts it, in “The Strange Case of Charlie Watrous,” this was the 1935 case—that in Oregon at least—would signal “a turning point of sorts, the moment in time when a state’s highest court embraced the science of document examination without reservation.” Judge De Muniz was the keynote speaker during the NADE 2010 Annual Conference in Portland, Oregon, which included an international delegation of members and guests.

Fundamental to our role as expert witnesses is our capacity to be clearly understood in the courtroom. Although much has been written about how to give effective testimony, Ruth Holmes’ deftly written article, “Convincing Testimony: A Document Examiner’s Impact on a Jury,” serves as a reminder to all of us, regardless of experience level, of the various elements involved in providing a jury with easy-to-understand courtroom testimony and exhibits.

Our next contributor is guest author David Markowitz, who was named by *The Best Lawyers in America* as Portland’s 2010 “Bet-the-Company” Litigator of the Year. “Expert Witnesses and Video Deposition: Strategies for Effective Performance” is a recap of the engrossing presentation that he and Troy S. Moody, Certified Legal Video Specialist, offered at the NADE 2010 Annual Conference,

illuminating their tactics for expert witnesses and emphasizing the importance that video depositions play in today’s judicial system.

Following this is a case report by Kay Micklitz, concisely detailing her forensic examination of a questioned symbolic signature (written without legible letters). In a step-by-step discussion of her method, Micklitz demonstrates how she came to form an opinion based on the observed difference in the direction of pen movement between the questioned signature and the group of exemplar signatures used for forensic comparison. The accompanying exhibits clearly illustrate these valuable observations.

This edition’s two technical reports each discuss a forensic methodology that can be useful in examining documents. First, Cina Wong and Larry S. Miller introduce the solid ink printer technology. They fully explain the design and operation of the relatively new and increasingly popular solid ink printer. Additionally, they include the specific visual and tactile reference points for differentiating one printing method (solid ink, ink jet and laser) from another. They also include charts showing the results of the Fourier Transformed Infrared Spectroscopy (FTIR) non-destructive tests.

Next, Hannah McFarland explains, in “Forensic Examination of Paper Fracture Patterns,” the procedure she used for resolving a case involving the questioned origin of several torn sheets of paper which were the key evidence in a dispute. She refers to the *ASTM E2288-09 Standard Guide for Physical Match of Paper Cuts, Tears, and Perforations in Forensic Document Examination*. The illustrations show the fracture pattern variations that support the methodology.

Our final two contributors are Shirl Solomon and Reed Hayes, each of whom selected an authoritative textbook for review. Insightful and thorough, these overviews serve to remind the reader of

what advances have been made in our field over the years. At the same time, the reader is also reminded that talent and intelligence, combined with a willingness to experiment and share the findings, are the cornerstones of our—or any—profession.

Shirl Solomon chose *Forged, Anonymous and Suspect Documents* by Captain Arthur J. Quirke, who worked as the handwriting specialist to the Irish Department of Justice in the 1920s. Readers will benefit from Solomon's careful sifting of the outmoded from the still-pertinent in what Quirke had to say as she discusses the terminology and methodology that once were cutting edge.

Reed Hayes reviewed Hanna F. Sulner's comprehensive *Disputed Documents: New Methods for Examining Questioned Documents*, originally published in 1966. Hayes includes a reference to Sulner's European background, noting that she was trained by and practiced with her father, Professor Julius Fischhof, who was recognized as the leading document and handwriting expert in Eastern Europe during the 19th century. Hanna Sulner's son, BFDE Diplomate and Attorney Andrew Sulner, assisted as editor, and contributed the photo of his mother. Thorough, respectful and objective, Hayes' analysis of Mrs. Sulner's seminal work is valuable reading for anyone in this field.

I would like to take this opportunity to say that my term as Editor-in-Chief of the journal has been a rewarding experience. Recognizing the absence of our journal for two years coupled with my residual exuberance from co-chairing the NADE 2010 Annual Conference, I was inspired to volunteer as

overseer of this edition. I welcomed a new editorial review board who brought a broad background of experience pertaining to publishing a journal. During this time, the guidelines for submission and the critical peer review process were updated to align with today's audience and technology. In addition, I consider myself fortunate to have been able to engage in many meaningful, in-depth exchanges with my colleagues.

I am pleased to thank the contributors and reviewers for sharing their expertise, research and critical feedback. In recognition of the role that published papers play in the forensic field, may this edition provide inspiration to all of our members to take advantage of the increasing number of publishing opportunities to share our knowledge and experience. I recommend that future editions of the journal include papers presented during our annual conference by members and by guest authors, and that the journal be published annually.

This edition was professionally edited by Sarah Koch, typeset by Reed Hayes, and printed by Walter Sofko of Oregon's Minuteman Press. Their indispensable know-how and dedication are greatly appreciated.

Abstracts and/or papers are now being accepted for peer review for the 2012 edition. The guidelines for submission are included on p. 43 of this edition, and can also be found on the NADE website: www.documentexaminers.org.

Jacqueline A. Joseph, B.A., CDE, D-BFDE
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The Strange Case of Charlie Watrous

by

Paul J. De Muniz

Chief Justice, Oregon Supreme Court

At what point in time does a field of study achieve recognition as a science, the unique province of experts? That question is often difficult to answer, perhaps because such recognition—if it occurs at all—often happens by degrees within different parts of society and at different times. The resulting paradigm shift—which may take years to accomplish—is more like a whisper than a bang, making it hard for historians to pinpoint a precise moment of change, despite being able to identify the specific factors that made change inevitable.

From a purely academic perspective, that is certainly true regarding the science of forensic document examination. As a general matter, most experts in the field would probably be hard pressed to reach a consensus on the precise moment in history when the document examiner's profile was elevated to scientific proportions. Some, for example, might point to the revised 1929 edition of Albert Osborn's seminal *Questioned Documents* as the putative watershed moment for the discipline; others to Osborn's original 1910 edition, and still others, perhaps, to the seventeenth century Italian "graphologist" Camillo Baldi. Reasonable minds can differ, particularly in a field that can trace some of its earliest iterations back to Aristotle.

Lawyers and judges, on the other hand—who are less inclined to employ a purely academic perspective in such matters—often make the same determination by resorting to the dustier state volumes of appellate decisions. Their quest is simplified by the fact that, within those collections of judicial opinions, there is frequently a case—more often than not an old one—that signals a turning point of sorts, the moment in time in which a state's highest court embraced the science of document examination without reservation. Sometimes that moment is marked by a holding that expressly recognizes the validity of the document examiner's work.

Sometimes, however, there is no explicit recognition of that fact at all; sometimes a case simply becomes, in retrospect, a demarcation line before which forensic document examination was discounted by the courts and after which it was not. In Oregon, that singular decision might well be the strange case of Charlie Watrous, 151 Or. 294, 49 P.2d 375 (1935).

Charlie Watrous was 47 years old in 1933, the year that he injured himself at the Salem Brewery Association's brewing facilities in Salem, Oregon. Throughout the 1920s, Charlie had worked at the Navy shipyards in Bremerton, Washington. He was, by trade, a stationary steam engineer, a tender of the boilers, pipes, and pressure gauges that helped power shipyard operations. Despite the fact that Charlie's skills made him capable of earning the princely sum of a \$1.00 an hour in 1933, he had—for reasons that would not become clear until later—nevertheless left the shipyards for points south, eventually settling in Salem with the woman who had captured his heart several years earlier, Bernice Watrous.

Charlie and Bernice had initially made their way by working as farm hands in the Willamette Valley until Charlie began his job as general mechanic, blacksmith and pipe fitter for the Salem brewery in 1933. The brewery was in the process of upgrading its works and the first six weeks of Charlie's employment found him routing and hanging new courses of pipe throughout the facility. One December morning at the brewery, Charlie gathered up his tools and a home-made ladder to continue his pipe-hanging chores. The ladder that he had selected for himself, he would later allege, was clearly "defective and unsafe in that it was constructed of two-by-four wooden uprights with one-inch wooden rungs, which were insecurely nailed to said uprights all of which [the Salem

Brewing Association] well knew.” On that morning, however, the ladder’s obvious shoddiness was apparently lost on Charlie, who mounted it, tools in hand, with gusto, only to have the first rung give way, sending him sprawling to the brewery floor.

Charlie had, it appeared, injured his right leg in the fall. Doctors subsequently diagnosed his condition as phlebitis, or inflammation of the veins in his leg. According to Charlie, the injury had permanently and totally impaired his right leg and with it, his capacity for gainful employment. Charlie set about suing the Salem Brewery Association for \$25,500 in damages.

At the trial that followed, Charlie Watrous was adamant that, prior to his fall at the brewery, he had enjoyed exceptionally good health, had never been injured and had “never suffered no pain in my leg until this.” To support that proposition, Bernice Watrous took the stand on Charlie’s behalf. They had been married, she testified, in 1931 in Tacoma, Washington. From that time until the time of his on-the-job accident, she continued, Charlie had simply never experienced any difficulties with his leg.

Charlie also had a piece of physical evidence to underscore his long history of otherwise good health: a discharge slip from the Bremerton shipyards with the name “Charles Watrous” handwritten in ink at the top. According to Charlie, Navy medical personnel had routinely examined him many times while he was employed at the shipyard and found him in perfect health. Any physical problems, he said, pointing to the discharge slip, would have otherwise been documented and made part of his discharge record.

As the case progressed however, several small problems developed concerning the discharge slip that Charlie had introduced into evidence. The official in charge of service records at the shipyard took the stand and testified that the shipyard’s discharge slips were all uniformly issued with a worker’s typewritten name rather than a handwritten signature. Moreover, it seemed—even to the

casual observer—that the discharge slip had been altered at some point because Charlie Watrous’s name appeared to have been written over an obvious erasure.

To drive that particular fact home, lawyers for the brewery called handwriting and document expert W. I. Staley to testify regarding the finer points of identifying erasures in documents. By contemporary standards, what happened next remains, by turns, both mystifying and troubling. Although Staley took the stand and his expertise as a document examiner was established without objection, the trial court nevertheless refused to permit his testimony to go to the jury. Outside the jury’s hearing an offer of proof describing Staley’s methodology followed, but to no avail. Charlie’s lawyer had successfully argued that in this case, no particular skill was needed to determine whether an erasure had been made on the discharge slip; one could ascertain as much with the naked eye by simply holding the document up to the light. And because no special skill was needed for that examination, he contended, the jury was as competent to pass on the question as the expert, and should be allowed to do so. Charlie Watrous, for his part, steadfastly maintained that the discharge slip was, in all respects, unaltered.

As arbitrary as the trial judge’s decision seems today, several factors probably made rejection of Staley’s testimony appear far less onerous in 1933. Strictly speaking, Staley’s status as a document examiner was not buoyed by his professional vitae. Staley was not a scientist, nor was he trained in forensic study; he headed up Capital Business College, a small trade school that specialized in training secretaries and stenographers. Although that background had undoubtedly exposed Staley to a wide array of erasures in the classroom, it lacked the kind of scientific heft that was, at the time, making significant inroads for forensic document examination in courtrooms throughout the country.

Oregon's judiciary retained, moreover, a deep-seated skepticism regarding expert testimony in the courtroom, a predisposition that teetered on the brink of anti-expert bias when it came to document and handwriting-related matters. In 1862, Oregon statutes had established that evidence regarding handwriting could "be given by a comparison *made by a witness skilled in such matters.*" That statutory acknowledgement of the expert's role in examining documents, would, however, be downplayed for the next 60 years in judicial opinions that tremulously warned both bench and bar against the mischief that could be wrought by so-called experts, particularly handwriting experts.

In 1913, for example, the Oregon Supreme Court affirmed the legitimacy of a will in *Wendl v. Fuerst*, 68 Or. 283, 293-95, 136 P. 1 (1913), a case in which two handwriting experts had taken the stand in probate proceedings below and testified that the will's signature had clearly been forged. In its written opinion, Oregon's high court decried the experts' role in the matter with the following fusillade of anti-expert pronouncements taken from various cases outside of Oregon.

From *Grigsby v. Clear Lake Water Works Co.* (California, 1870):

"[I]t must be painfully evident to every practitioner that these witnesses (experts) are generally but adroit advocates of the theory upon which the party calling them relies rather than impartial experts upon whose superior judgment and learning the jury can safely rely. *** Such evidence should be received with great caution by the jury."

From *The Tracey Peerage case* (Great Britain, 1843):

"Hardly any weight is to be given to the evidence of what are called scientific witnesses. They come with a bias on their minds to support the cause in which they are embarked."

From *In re Foster's Will* (Michigan, 1876):

"Everyone knows how very unsafe it is to rely upon any one's opinion concerning the niceties of penmanship. The introduction of professional

experts has only added to the mischief instead of palliating it, and the results of litigation have shown that these are often the merest pretenders to knowledge, whose notions are pure speculations. *** Every degree of removal beyond personal knowledge, into the domain of what is sometimes called with great liberality scientific opinion, is a step toward greater uncertainty, and the science which is so generally diffused is of very moderate value."

From *Cowan v. Beall* (District of Columbia, 1874):

"The signatures of these papers are claimed not to be genuine, and here we are treated to the opinions of half a dozen men who claim to be experts and who come up and give us their views as to the genuineness of these signatures. Of all kinds of evidence admitted in a court, this is the most unsatisfactory. It is so weak and decrepit as scarcely to deserve a place in our system of jurisprudence."

From *Mutual Benefit Life Insurance Co. v. Brown* (New Jersey, 1878):

"All doubt respecting the competency of the opinion of experts in handwriting, based upon mere comparison, as evidence has been removed by statute; but it still must be esteemed proof of low degree. Very learned judges have characterized it as much too uncertain, even when only slightly opposed, to be the foundation for a judicial decision." *Wendl*, 68 Or. At 293-95.

Although those observations had been collected over 20 years before Charlie Watrous's case had come to trial, it was clear that the sentiment they expressed lingered on in 1933, at least in one Oregon courtroom. It might have held sway even longer had not the Salem Brewery Association made a discovery that would eventually place Charlie's case directly before the Oregon Supreme Court.

At trial, Charlie's claims had made their way to the jury, which found in his favor, awarding him \$6,000 in damages. Two weeks later, however, the brewery moved for a new trial, citing startling new

evidence set out in an affidavit from Sadie Gossett, a Bremerton, Washington, housewife. The trial court rejected the motion as “unfounded,” and in the appeal that followed, the Oregon Supreme Court learned why Charlie’s discharge slip from the Bremerton shipyards had featured such a prominent erasure.

Charlie Watrous, it seems, was not Charlie Watrous; he was Charlie Gossett, husband to Sadie and the father of the couple’s three children. According to Sadie Gossett’s affidavit, Charlie had abandoned the family—and his 19-year marriage—four years earlier in order to take up with Bernice Fox, a woman who, apparently, had broken up other happy homes in the Bremerton area before lighting on Charlie and abandoning her own family to play the role of the fictitious Mrs. Watrous. Charlie had not bothered with the formalities of a divorce in leaving Sadie; he had simply disappeared one day and adopted the last name of Watrous to avoid the inconvenience of alimony and child support payments.

There was little doubt that Charlie Watrous and Charlie Gossett were one and the same. Attached to Sadie Gossett’s affidavit was a photograph of Charlie and the family dog taken in happier days, along with the description of a malady that Sadie Gossett’s husband had suffered from. Charlie Gossett, it seemed, was plagued with chronic pain and swelling in his right leg that often left his ankle weak, just like Charlie Watrous.

The Oregon Supreme Court wasted little time in concluding that the trial court had erred in not granting a new trial based on that newly-discovered evidence. And in anticipation of that trial, the court went on to address several other related matters, among them, the trial court’s refusal to allow document expert W. I. Staley to testify. In a single succinct, but pointed paragraph, the court wrote:

“In our judgment the evidence offered was admissible. The condition of the slip was such that a layman might not understand it, and it required

an expert to make it clear to the minds of the jury. *Wigmore on Evidence* (2d Ed.) § 2027. It was a matter of importance whether the erasure was made before or after the name ‘Charles Watrous’ was written thereon.” *Watrous v. Salem Brewery Ass’n*, 151 Or 294, 304 (1935).

Charlie Watrous’s lawsuit was remanded for a new trial. Whether the trial ever took place, or its ultimate outcome, is unclear as a historical matter. And the factor in Charlie’s case that had turned the tide so forcefully in the expert’s favor? That, too, remains unclear. It could have simply been the times. Shortly before the opinion in Watrous was published late in 1935, the field of document examination had made national front page news when the testimony of handwriting experts helped convict Bruno Hauptmann of murdering the 20-month-old son of Charles and Anne Lindbergh. Or it might have been the notion that whatever mischief an expert could create on the witness stand was preferable to the havoc caused by scoundrels like Charlie Watrous. In any event, what is clear is this: After the Oregon Supreme Court’s decision in the strange case of Charlie Watrous, the court was never again confronted with a matter in which a properly qualified document expert was prohibited from presenting testimony to an Oregon jury.

Paul De Muniz was raised in Portland, Oregon, and attended Portland public schools. After high school he enlisted in the U.S. Air Force and served in Vietnam (1968-1969). He earned his BS from Portland State University in 1972 and his JD from Willamette University in 1975. He has served on Willamette University’s Board of Trustees since 2006, and has taught “Oregon Criminal Procedure and Practice” at Willamette since 2004. De Muniz and his wife, Mary, reside in Salem and have three grown children.

De Muniz began his career as a deputy public defender, and entered private law practice in 1977 as attorney and partner at Garrett Seideman Hemann Robertson & De Muniz in Salem. In 1990

he was appointed to the Oregon Court of Appeals. He was elected to the Oregon Supreme Court in 2001 and elected the court's 41st chief justice in January 2006.

Throughout his distinguished career, De Muniz has championed issues related to access to justice, fundamental fairness in courts, and enforcement of the rule of law in this country and around the world. He gained national recognition for his successful pro bono representation of a migrant worker wrongfully convicted of murder. That case publicized how linguistic and cultural differences can unfairly penalize immigrants in the American Justice System and led to significant state and national legal reform. In 2002 De Muniz founded a rule of law partnership with judicial leaders in the Russian Far East, assisting judicial leaders, lawyers and law professors in implementing legal reforms to promote the enforcement of the rule of law in Russia.

De Muniz's awards include: the Global Business Award, the Oregon Hispanic Bar Association's Paul J. De Muniz Professionalism Award, the Edwin J. Peterson Racial Reconciliation Award, the National Association of Criminal Defense Lawyers Judicial Recognition Award, the Oregon Area Jewish Committee 2010 Judge Learned Hand Life-

time Achievement Award, and the Classroom Law Project 2011 Legal Citizen of the Year Award.

De Muniz has served on the Board of Directors of the Conference of Chief Justices and recently completed a three-year Harvard University Executive Session for State Court Leaders in the 21st Century.

De Muniz is frequently asked to speak, both nationally and internationally, on maintaining the independence and impartiality of the judiciary, judicial administration and the funding of state courts. In September 2010, De Muniz was invited to address Chief Justices and judicial leaders from 55 countries at the Asian Pacific Courts Conference on the topic of Strategic Planning for the Judicial Branch of Government, and in October, at New York University Law School, De Muniz gave the 17th Justice William Brennan lecture on State Courts and Social Justice. That lecture was entitled "Overturning Precedent: The Case for Judicial Activism in Reengineering State Courts."

Paul J. De Muniz
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Convincing Testimony: A Document Examiner's Impact on a Jury

by

Ruth Holmes, CDE

In collaboration with Sarah Holmes Tucker, MA

Abstract: A document examiner plays an unusual role in the courtroom since every juror has a signature, writes or prints in some form, and thus may be naturally inclined to closely follow the testimony of a handwriting witness. In response to questions, testimony is given, whereby the findings from the examination of documents that contain questioned handwriting are explained. This process, to be effective, requires not only the examiner's ability to communicate with attorneys and other courtroom players, but also that the expert present themselves and the exhibits in a way that support their opinions competently and credibly. The witness is ultimately teaching the jury, a group of total strangers to the field, how to compare, contrast and understand the fine details of handwriting examination.

Key Words: Document examiner, handwriting, courtroom testimony, courtroom players, jury, judge, attorneys, presentation of exhibits.

Forensic, criminal and judicial programs permeate the airwaves, bringing the spotlight on expert witnesses in all disciplines. Judges and jurors alike are looking for the testimony of experts who are competent, credible and able to communicate verbally and demonstratively with their exhibits. When the jury weighs the evidence, they will remember what they regarded as the most convincing testimony that they had seen and heard.

"The responsibility of the juror in the administration of justice is more clearly understood when he is described by his full title, 'The Juror, the Judge of the Facts.' His responsibility is shown to be still greater when it is also understood, as has been clearly stated by many eminent authorities, that in trials generally the discovery and proof of the facts is the most difficult phase of the proceeding and in many cases the only phase. In most trials this so-called final 'judging the facts' is really deciding the case, and this, it appears, is not a task

for the trained lawyers nor the learned judge but for the humble juror."¹

Trials can be long, tiresome, technical procedures, but there is something unique about a case involving handwriting to which jurors can relate, whether it be an altered will, a forged check, a bomb threat, an anonymous letter or the scribbling of a jailhouse snitch. Every juror has a personal connection to a case with a handwriting component because each of them has a writing style that is distinctive. Add the intrigue or tragedy of a particularized case that has brought the document examiner into the court and it is a perfect combination of mystery offered by the court, blended with the awakened curiosity of the jury.

"Of all men, lawyers ought to know that proof is often disguised and distorted if not destroyed, simply because it is not presented in the right manner, at the right time, and in the right order. Correct and credible proof may also be greatly weakened because of the personality of the witness giving it or of the lawyer eliciting it."²

Unlike a ballistics expert, a document examiner plays an unusual role in the courtroom because their testimony relates to handwriting, something every member of the jury does one way or another. In explaining a letter form, natural variation, spacing or movement, each juror can see and understand the testimony based on the strokes of their own writing, printing or signatures. Their testimony is different from that of a chemist, engineer or pharmacist, who might present and explain components, formulas, physics or mathematics. No matter what the subject, jurors are asked to understand what-

1 Osborn, Albert: *The Mind of the Juror as Judge of the Facts or The Layman's View of the Law*. Fred B. Rothman & Co., Littleton, CO, 1937, p. xi.

2 Osborn, op. cit., p. 115.

ever testimony is presented.

Media accounts of cases involving handwriting examination have long held a fascination for the general public. Older jurors might be familiar with such cases as the Lindbergh kidnapping note, the authenticity of the Hitler diaries or the will of Howard Hughes. Many of the younger jurors may only have knowledge of handwriting cases that they have seen in the news such as the ransom note related to the murder of Jon Benét Ramsey, the identity of the writer of the threatening note in the Washington Sniper cases or most recently the handwritten notes of alleged gunman, Jared Loughner, found in his apartment following the shooting in Tucson of Congresswoman Gabrielle Giffords in 2011.

Most forensic cases do not make it into the headlines or onto the evening news, but from the moment he/she becomes involved, the document examiner's preparation for testimony may influence whether a case is settled or actually goes to trial. When the results of document examinations are compelling, many cases are settled out of court. A person might be willing to forge a signature but will stop short of insisting on going to trial where they might then commit perjury about the forgery, especially when the evidence is overwhelmingly against them. Judges will hear testimony at preliminary hearings and determine, based on the evidence available, whether a case will actually move on to trial. At times, often with the examiner sitting outside of the courtroom waiting to testify, the case may be settled because of the excellent preparation of the exhibits allowing the evidence to prevail.

When the document examiner is required to appear in court, whether for a bench or jury trial, their task is to communicate the evidence. Testimony is given to explain the findings following the examination of documents that contain questioned handwriting. This process combines not only the examiner's ability to communicate with attorneys and other courtroom players, but to present exhibits that support their opinions, ultimately teach-

ing the jury, a group of total strangers to forensic document examination, how to compare, contrast and understand the fine details of handwriting examination.

"Experts with teaching experience are often the best testifying experts at trial. Look for that experience on the resumes of experts...consider[ed], and if...[there is a] choice of more than one expert on an important issue for trial, choose the expert who is the better teacher over the one who may be more gifted in the field. Teaching isn't limited to academia; an expert who has been responsible for training on the job may do a good job of teaching jurors too. Again, the witness' connection with jurors, and jurors' ability to understand and remember the testimony, are more important than having the most impressive resume."³

Jurors are essential to the legal system, and consideration of their reactions to the document examiner's demeanor and materials cannot be overestimated. From the preparation of an exhibit book accompanying a letter of opinion to the final presentation of materials for court, serious consideration must be given to how the evidence will be interpreted by the jury. Whether the work product is shown to an opposing attorney, a judge, a grand jury or a jury, the clarity and quality of this part of an examiner's testimony can determine whether a case actually goes to trial and it can have a lasting impact on the final verdict in a case. Handwriting exhibits engage the jurors in the audio and visual understanding of how examiners arrive at their conclusions. The jurors' participation makes them part of the discovery process as they see and hear how the questions are answered. Is it a genuine signature or not? Who wrote the notes?

"A good witness is one who relates facts audibly, briefly, correctly and clearly. To correctly describe a transaction, or clearly relate an incident, is an excellent test of general intelligence."... "Simplicity is not a characteristic of simpletons

³ Crawford, Richard & Morris, Charlotte: *The Persuasive Edge*. Lawyers & Judges Publishing Company, Inc., Tucson, AZ, 2006, p.172.

but of wise men.”⁴

The greatest impact on a jury comes with the explanation of hands-on materials that are easy to understand and without ambiguity. An opposing attorney may try to stop testimony as being a *narrative*, but the opportunity to point out specific points on composites, photographs, exhibit boards, or by showing overhead projected images or a Power Point demonstration, is a crucial time in a case. Jurors like to be engaged in the problem-solving process of a trial. Good exhibits are tangible, visual, creative and thought-provoking. The document examiner can determine the focus of the jury with well planned exhibits and a clear explanation of how the opinion was reached.

“Educational psychologists also know that most individuals are more efficient learners when information is presented through more than one sensory channel. Thus, a message that you only hear will be less likely to register than a message that you hear, see through a pictorial or written representation, and record through your own act of writing.”⁵

Juries are made up of a cross section of the population in age, race, education and professions. As such, these varied individuals bring to the courtroom their own personal experiences and thought processes to bear on the case at hand. Most of them are not serving on the jury by choice, so the more engaged each juror can be in the legal action taking place, the more attention they will pay to the evidence. Some jurors respond to the facts and figures in verbal testimony while other jurors are impacted by color and visual images. Handwriting examiners do not take sides when taking a case, but their skill in preparing evidence and giving testimony as to their findings can have a significant impact on a jury. As cited in Crawford’s *The Persuasive Edge*:

“Reliance on any single form of visual aid will

⁴ Osborn, op. cit., p. 43.

⁵ Jones, Susan: *Selecting and Influencing Your Jury*. The Professional Education Group, Inc., Minnetonka, MN, 2004. p. 10.

be tedious...for the jury. Look for ways to maintain jurors’ interest and attention by incorporating different visual aids, each of which is most appropriate for the point...[the witness] want[s] to make.”⁶

In a case involving handwriting, jurors are being asked to learn a forensic language of comparison using space, form, movement, alignment, proportions, pressure, line quality, entry and terminal strokes. The better the diagrams, the more precise the descriptions and more confident the expert, the more credible a juror will find the testimony to be. The evidence is assimilated, evaluated and used to reach a verdict. Court exhibits, that show how a document examiner reached their conclusions, provide a pathway for jurors to discover their own facts, to listen to the expert’s explanations and then to use this combined information in helping reach a verdict.

“There is sound psychological research attesting to the need for clear communication of the case to the jury. The strength of the evidence, as jurors perceive it, is the most important determinant of the jury’s verdict. Although a juror will bring predisposing beliefs and attitudes into the courtroom (he is not, nor can he truly be, a ‘tabula rasa’), these are most likely to be acted upon when the case is incomprehensible.”⁷

The education of a document examiner extends beyond the knowledge of the subject matter, beyond presentation of exhibits and beyond personal appearance. The training should also include learning the impact their communication skills will have on the jury. In his introduction to Albert Osborn’s book *The Mind of the Juror*, John Wigmore wrote:

“Here are the recorded reflections of a wise man who has sat in courtrooms, day after day for the better part of a generation, in nearly every region of our country, before every kind of a judge and every kind of a jury and in all sorts of contested cases, awaiting his turn to testify, and meanwhile

⁶ Crawford, op. cit., p. 232.

⁷ Jones, op. cit., p. 9.

studying the mental operations of the jurors, in the light of his knowledge of the case.”⁸

Even the most experienced document examiner needs to have jury awareness when testifying. Jurors make their observations, drawing their own conclusions based on everything a document examiner does, says, shows, explains and even wears from the moment he/she enters the courtroom.

“Do not assume that expert witnesses—because they are experts—are also necessarily more effective communicators when on the stand. Many times they are not, and they require the same direction...before trial that...would [be] give[n] to lay witnesses. Experts are great when they exude confidence about their subject matter and the conclusions they’ve drawn about...[the] case. But that confidence easily spills over into arrogance, even before they come under fire from opposing counsel. Once under cross-examination, arrogance can also quickly turn to defensiveness, and neither of these are attractive traits.”⁹

Presentation is paramount to impacting a jury, as illustrated in the following exhibits that were part of two trials in Michigan. Exhibits need not be elaborate, but they need to be easy to understand and follow, using colors or numbers when they are explained to the jurors. After laying a foundation of the principles of forensic document examination in response to the attorney’s questions, the document examiner can then demonstrate to the jurors how to see through the examiner’s eyes and learn how a conclusion is reached.

Color-Coded Court Exhibit: Murder for hire

Illustration #1 is from testimony in a murder-for-hire trial for the death of a librarian, Martha Gail Fulton, in a rural community outside of Detroit, Michigan. In 1999, her husband, George Fulton, was working as a traveling salesman and he began a personal relationship with his client, Donna Trapani, for whom he did medical billings for her health care business in Florida. Trapani paid friends \$7,500 to travel to Michigan to kill the wife

of her lover. Trapani never left Florida at the time, but gave her friends a detailed note telling them where to find Fulton’s wife. This note became the questioned document because it was found in the get-away car after the shooting which was caught, in its entirety, on the library parking lot’s surveillance camera.

The FBI provided the Oakland County Sheriff’s Office a large quantity of love letters that had been exchanged between Fulton and Trapani. They were in cursive writing and printscript except for a few hand-printed notations observed on one of the letters. Those few compelling handprinted words were presented in the exhibits that the jurors used to form their opinion, finding Donna Trapani, her best friend, and the shooter guilty of first degree murder, resulting in mandatory life sentences of imprisonment without parole. The driver of the car received 25 to 40 years in prison.

The document examiner thoroughly examined extensive pages of documents, prepared an exhibit book with all of the love letters, prepared composites of the documents (See Illustration #1) including a color-coded legend. The jury was shown a sample of the cursive letters, the questioned note with directions to find the librarian (QD-1), the few handprinted words written by Trapani observed on one of the love letters (K-1), an example of Trapani’s printscript (K-4B), and court exhibits marked with colored arrows to show similar letter forms.

Color-Coded Court Exhibit: Bank robbery

In 2005, an Oakland County, Michigan, jury heard testimony about a bank robbery spree in Birmingham, Michigan. The local police called for a document examiner. Two questions were asked: 1) Were all three threatening notes written by the same person? and 2) If so, were the three notes written by the person who had written a complaint letter to a judge in an unrelated matter?

Several exhibits were used to explain the findings during testimony in the case. Illustrations #2 and #3 demonstrate how the jury was directed to

⁸ Osborn, op. cit., p. vii.

⁹ Crawford, op. cit., p. 171.

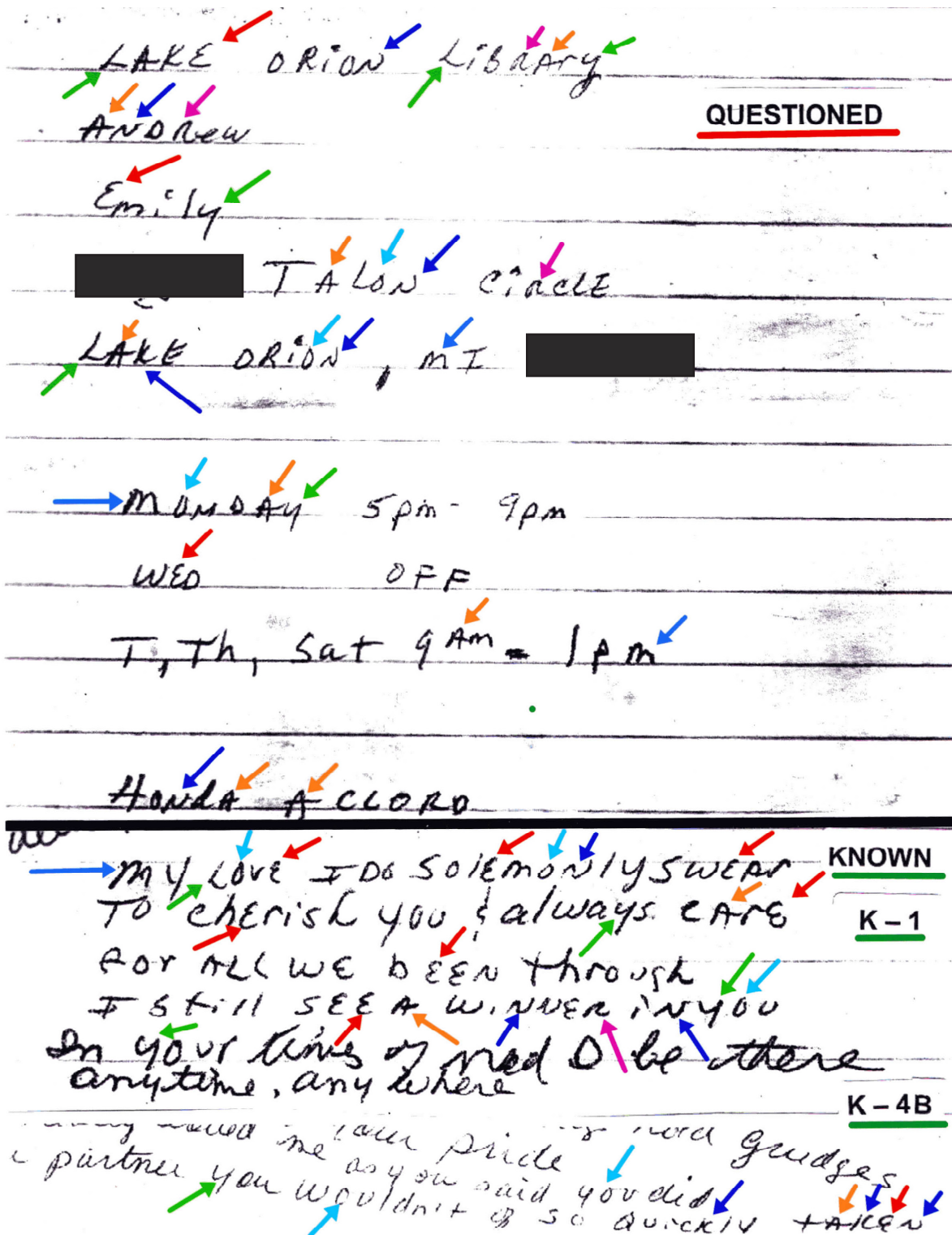


Illustration #1. Composite of the questioned note (QD-1), known Trapani printing (K-1), and a sample of Trapani printscript (K-4B). The questioned and known exemplars were color-coded, compared to each other, and described, during the trial, in detailed testimony by the document examiner.

QD - 1 Charter One Bank 12/7/04

I HAVE
A GUN
GIVE ME
THE MONEY
OR I
will Kill
You.

QD - 3 Found in Coat Pocket

I HAVE
A GUN
GIVE ME
THE MONEY
OR I will
Kill You!!!

QD - 2 Fidelity Bank 12/8/04

FIDELITY BANK **WITHDRAWAL TICKET**

☐ MMDA ☐ Savings

19-878 747

149-67967-☐

CUSTOMER NAME _____

CUSTOMER SIGNATURE _____ Conf. _____

TRANSACTIONS ARE SUBJECT TO BANK'S ACCOUNT TERMS AND CONDITIONS.

Amount \$ _____

AMOUNT IN WORDS _____

I HAVE
A GUN
GIVE ME
All of
the Money
Now!!!

38 072412655

GBF INC. 313-699-4040 FIDE F5005 REF. 04827

Illustration #2. Three notes (QD-1, QD-2 & QD-3) shown to tellers in the bank robberies were compared to each other to determine if they were written by the same person.

KNOWN

K-2

trial in order to argue that, but according to [REDACTED] 420 Mich. [REDACTED] 2 N.W. 2d 655 (1984), that could have been argued, but my attorney refused to do so.

Second, I ask him to argue that Ofc. Kate [REDACTED] give false testimony at my preliminary examination, that she photograph and seized a 1992 Mercury Topaz at my home, but according to the testimony given at my evidentiary hearing, there are no photo's and no record of the car ever being seized. This issue could have been argued according to People v [REDACTED], 102 Mich. [REDACTED] 302 N.W. 2d 209 (1980), but he refused to argue them stating that I have to wait until my trial.

I've asked him for evidence that's apart of my discovery, but I have not received it yet. These are just some of the things that I've tried to talk to him about, but we are not getting along. So, I ask that the court's please appoint me new counseling in order for me to receive a fair and impartial trial.

Thank You.

[REDACTED] Gra [REDACTED]
Case # [REDACTED]

Illustration #3. Page two of the complaint letter (K-2) showing the color-codes used for comparison to the three threatening notes (QD-1, QD-2 & QD-3) that were presented to the bank tellers as seen in Illustration #2.

use their powers of observation in understanding the information they received from the document examiner's testimony. One of the threatening notes (QD-3) was found in the coat pocket of a man when he was being booked into the county jail after he was picked up on a separate charge. This note connected him to the bank robberies. The Prosecutor's Office received permission to have the complaint letter (K-2) examined and compared to all three questioned notes.

Handwriting testimony was given that the three notes were written by the same person and that person also wrote the complaint letter to the judge.

Visual exhibits are remembered by a jury if they are clear, unambiguous and use points of explanation with colors for identification of similarities or dissimilarities. When exhibits are accepted into evidence and actually passed into the jury box, there is an opportunity for the jurors to draw conclusions based on the details they observe, understand and remember from the testimony of the expert witness. The exhibits become central in the decision-making process in deliberations leading to the resulting verdict.

When the testimony of two experts conflicts, they neutralize each other in the minds of the jurors unless one of them has made a sounder, more convincing presentation. Osborn said, "If jurors must decide as to the merits of conflicting testimony they prefer to hear the witnesses instead of reading their testimony or have it read to them."¹⁰ He also said:

"It would be helpful to put up in courtrooms, where lawyers and witnesses could all see them, some conspicuous, plainly lettered placards saying: 'He who speaks and is not understood is dumb'; 'It is a discourtesy to a hearer to speak indistinctly'; or 'He says nothing who is not understood'. Jurors suggest that the judge have these helpful placards made; they should be in every courtroom and within sight of every witness and every lawyer."¹¹

¹⁰ Osborn, op. cit., p. 125.

¹¹ Osborn, op. cit., p. 161.

"It is surprising that many pleaders who seek to persuade juries apparently make so few excursions into this little known field—the juror's mind. Their main interest appears to be in the fact of evidence rather than in the effect of evidence."¹²

In 1937, Albert Osborn knew the importance of understanding the role of jurors in document examination. It is time that those in the field embrace the fact that testimony alone is not enough. They must learn how their convincing testimony, communication styles, exhibits and presentations ultimately impact the jury.

¹² Osborn, op. cit., p. vii.

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For almost 20 years, Ruth worked as a document examiner for the Office of the Prosecutor and sheriff's office in numerous criminal trials in Oakland County, Michigan. She is a nationally recognized speaker, media guest, writer, jury and trial consultant and forensic expert.

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Expert Witnesses and Video Depositions: Strategies for Effective Performance

by

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With additional editing by Joel J. Strong, JD, Lewis & Clark Law School

The advance of technology has impacted how attorneys and witnesses behave in a deposition. The use of video depositions has increased dramatically over the last ten years. Prior to video- and audio-recorded depositions, the primary concern was with the impact of the witness' word choice on paper. But in today's courtroom, the jury and judge may see—and hear—more than the witness' written words; the witness' tone of voice, or stammering in the deposition, may enter into evidence. The same is true for facial expressions, hand gestures, style of hair, and clothing choice. A witness in a deposition must exercise self-control over more elements of communication than was the case just a few years ago. It is more critical than ever for witnesses to be fully prepared for the deposition process prior to entering the deposition room.

Proficiency in video depositions is even more essential for expert witnesses. Many experts testify in multiple trials a year. In drawing on my thirty-five years of litigation experience, here are the following techniques and strategies for the expert witness to use to maximize his or her effectiveness in video depositions.

What to wear

Experts should dress for the video deposition in essentially the same manner and with the same formality that they plan to dress for the trial. If the expert plans on wearing a tie and sports coat during the trial, the expert should wear a tie and sports coat during the deposition. Jurors are attentive. They catch differences, even small ones, such as a minor change of jewelry. Any thoughts about why the differences in attire occurred are thoughts that detract from the statements made by the expert. For effective performance in a video deposition,

an expert should try to reduce these differences in attire as much as possible. This is not to say that an expert should wear precisely the same articles of clothing at the deposition and trial, but only slight adjustments should be made. For example, for an expert who wore a sports coat and tie at the deposition, the same sports coat with a different tie at trial would minimize any distraction created by the expert's attire.

Of course, any person would have difficulty recalling what they wore several months prior at a deposition. One way to maintain a sense of consistency is to take a self-photograph on the day of the deposition, and save the photo along with the case notes or deposition transcript. This practice is especially useful for experts who typically testify in several trials a year.

Practice on camera

Most expert witnesses are comfortable speaking in front of juries. But not all experts are familiar with watching a videotape of themselves. With video depositions, parts of the expert's deposition may be played again during trial while the expert is on the witness stand. Watching one's self on video for the first time may be unnerving. To limit discomfort, expert witnesses should practice speaking on video and become familiar watching their performance. It may be helpful if the expert and attorney arrange to videotape a practice question-and-answer session. In addition to increasing the familiarity of observing oneself on camera, the expert may also decide to make some improvements to their physical appearance or some other aspect of their presentation style.

For all practical purposes, the expert should behave as if they were actually in the courtroom. Depositions are frequently carried out in

small, informal conference rooms. People freely move about, get cups of coffee, and come and go throughout the deposition. The videotape is for the jury, and the expert should behave exactly as they would want the jury to see them. During the videotaped deposition, experts should continually envision a jury behind the camera. This does not mean that the expert must look into the camera when answering questions, but the answers and mannerisms should be tailored as if the jury were present. Practice will help the expert behave during the deposition as they expect to in the courtroom.

Video performance warnings

The camera amplifies, magnifies, and distorts. For example, if a deponent makes subtle, extraneous sounds during the deposition, those sounds become louder, perhaps even obnoxious when the video is played back. An expert's unnecessary mannerisms, no matter how small, will become apparent and distracting. Shuffling paper, the flicking of a pen, or rubbing hands together are frequent nervous habits that distract juries. On camera, the excessive mannerisms will divert from the content of the expert's testimony.

As the deposition wears on, fatigue sets in and it becomes more difficult to maintain positive body language and an authoritative tone of voice. Ask for rest breaks if needed. As the deposition stretches on, experts should frequently assess their own level of energy. One sign of growing fatigue is one's placement in one's chair. As fatigue sets in, deponents have a tendency to slide their haunches forward in their seat and slump back. In this posture, elbows are no longer placed on the edge of the table and the arms usually drape over the body. This posture is less commanding and an expert's answers will appear less authoritative on camera. One way to avoid this is for witnesses to keep their tail as close to the back of the seat as comfortable during the entire videotaped session. Doing this keeps the body perched forward and appears more confident. If an expert becomes aware of growing fatigue, or notices his or her placement in the seat shifting forward to the edge, the expert should feel

no hesitation in requesting rest breaks.

During video depositions, an expert should avoid excessive pauses because the length of the pause is captured on the video for view by the audience. In traditional transcribed depositions, pauses do not have an impact on a jury since only the statements made during the deposition are recorded on paper. But in video depositions, the effect of a pause is greatly exaggerated. Juries infer from on-camera pauses that the expert is unsure of his or her answers or that the expert is making up the responses while answering the questions. While an expert should give all of the thought necessary to answer the questions, the expert should make efforts to move more quickly through the thought process during a video deposition than they might in a traditionally transcribed deposition.

An expert should always avoid arrogance or argumentativeness in any deposition. This is even more important for video depositions where fleeting expressions or slight changes in tone of voice may indicate these types of negative responses. What may come across as a simple short or curt answer on paper may be transformed into something much more if accompanied by a sneer or dismissive hand gesture on video. These negative displays are unappealing to a jury and may have a destructive impact upon the case.

Conclusion

For experts who seek to expand their practice as expert witnesses for trials, it is essential that they prepare themselves to perform well during depositions. This is also true for veteran experts who have been testifying in trials for many years. Improved performance in depositions will lead to a higher number of referrals and a reputation as an effective expert witness amongst trial lawyers. With the increasing number of video-taped depositions, expert witnesses should prepare and adjust their performances accordingly.

David Markowitz, J.D., considered to be among the best trial lawyers in the Northwest, is a courtroom icon. For more than three decades, he has tried countless high-profile cases in state and federal courts and arbitration proceedings. When he's not trying high-stakes cases, or giving lectures to young attorneys about how to be first-rate advocates, he's sharing advice with his colleagues on the best practices for rainmaking. Dave is a natural born orator and teacher who is known for his ability to connect with jurors.

He regularly speaks on numerous topics such as depositions, cross and direct examinations, jury selection, witness preparation, opening state-

ments, closing arguments, case strategy, alternative dispute resolution, and business development, to name a few.

Dave is a founding partner of the business litigation firm Markowitz, Herbold, Glade & Mehlhaf, P.C. He shepherded the firm from its beginnings as an ambitious two-attorney litigation shop to its present status as one of the premier business litigation firms in the region.

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The Forensic Examination of a Symbolic Signature: A Case Study

by

Kay Micklitz, BCDE

This is a case study involving a one-page holographic Will allegedly signed by the decedent just before his death. The holographic Will left everything to the decedent's new wife of six weeks. When the decedent's daughter saw this Will, with her father's alleged signature, she was shocked. The decedent's daughter, being familiar with her father's signature, challenged the alleged signature of her father on the new Will because "it didn't look right." It became the questioned signature for this examination.

The questioned signature consisted of three uniquely individual strokes, each stroke superimposed over the other. It is considered and termed a symbolic signature because it has no discernible letters of the alphabet, which renders it illegible as far as being able to define the actual name of the signer. Several known contemporaneous signatures of the decedent were provided for examination and comparison analysis. The original of the holographic Will had been filed for probate in another city more than a four-hour drive from this examiner's office. Due to the distance to the courthouse and other circumstances, a good photocopy of the Will was produced for this examination.

A thorough examination was conducted in order to separate and identify the individuality of each of the three superimposed strokes of the questioned signature. By using a microscope, the feathered starting point and the blunt ending point of each of the three unique strokes was observed.

The questioned signature was then scanned into the computer using the PaperPort software program. Then the erase-feature of the PaperPort program was used to eliminate overlapping strokes revealing individual strokes. (See Exhibit #1)

Once each of the three strokes had been separated from the overall signature, still using the same

software, the characteristics indicating the direction of the pen movement were further revealed.

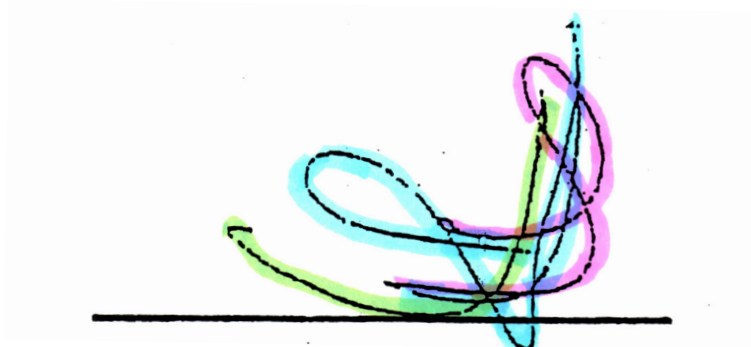
The first stroke (See Exhibit #1, Stroke #1) had a short initial upstroke which was retraced with a downstroke moving toward the baseline, curving backward at the baseline and extending to the left. The result was that the stroke appeared as a simplified letter "J." The letter "J" had a hook-like ending stroke.

The second stroke (See Exhibit #1, Stroke #2) was created in an initial rightward direction moving horizontally above the preprinted baseline. The pen stroke turned upward, creating an elongated loop with a flamed-top point. Then the stroke turned down toward the preprinted baseline, and dipped below the preprinted baseline. Next, the stroke turned leftward and continued up above the preprinted baseline, moving in a counter-clockwise direction to create a loop extending above the initial horizontal stroke. This stroke ended with a straight horizontal line below the counter-clockwise loop.

The initial movement of the third stroke (See Exhibit #1, Stroke #3) began in a long rightward direction moving horizontally parallel to and above the preprinted baseline. The stroke continued upward to form a loop at the top of the stroke. Moving in a clockwise direction, the stroke descended down toward the baseline and then completed a loop moving in a clockwise direction, ending with an eyelet-like closure. The stroke, itself, appeared as a somewhat incomplete letter "S."

Next, it was necessary to separate and identify the individuality of each of the three strokes comprising the known signatures in order to determine the direction of the pen movement of each stroke in the known signatures. A comparison examination of each of the three strokes in the questioned

**Questioned Signature
October 2000**



Three Fundamental Strokes of the Questioned Signature:

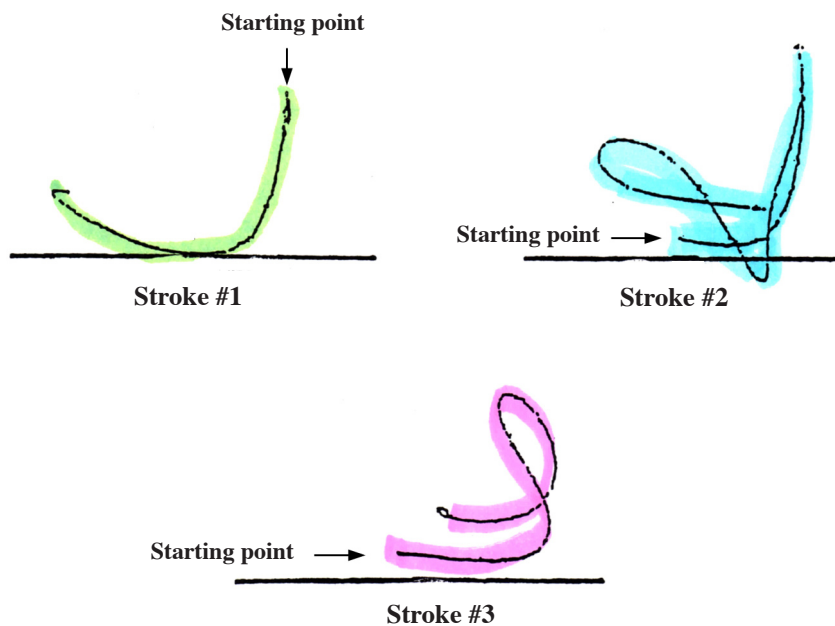
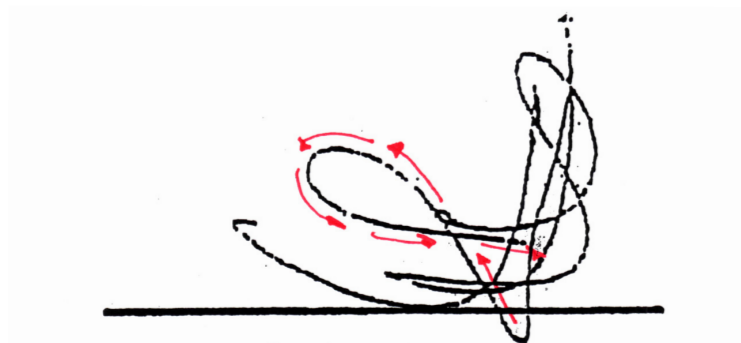


Exhibit #1. The questioned signature is termed a “symbolic signature” because it has no discernible letters of the alphabet, rendering it totally illegible; therefore, the name cannot be deciphered. Note: Enlargements have been made for illustrative purposes.

Questioned Signature
October 2000



Known Writing Samples:



K1, 10/14/00



K2a, 11/27/00



K2b, 11/27/00



K3a, 11/29/00



K3b, 11/29/00



K4a, 12/1/00



K4b, 12/1/00



K5a, 12/2/00



K5b, 12/2/00

Exhibit #2. Red arrows indicate the stroke's direction of movement of a selected and identical portion of each signature. The counter-clockwise movement in the questioned signature is different from the clockwise movement in all of the known signatures, and this was a compelling characteristic useful in forming the expert's opinion in this case. Note: Enlargements have been made for illustrative purposes.

signature was made with the three strokes in the known signatures.

The examination and comparison revealed that, in the known signatures, Stroke #2 was consistently made in a clockwise direction, versus the counter-clockwise movement used in the questioned signature. This fundamental difference in the direction of the pen movement in forming the loops was used as the basis of forming the opinion that the questioned signature had been written by someone other than the decedent.

References:

1. "In a totally illegible signature it is often possible to determine in which direction the majority of the strokes are written, and in this respect, the strokes will conform to the related structures in the normal signature. With a forgery, although similar strokes may be present, they will not necessarily have the same direction of writing as those they pretend to represent." *Suspect Documents: Their Scientific Examination*, Wilson R. Harrison, p. 412.

2. "The shape of a person's signature often varies, but the stroke order and writing direction almost never changes. Anti-Forgery Method Traces Signatures' Finer Points, Technology can show telltale direction and order of pen strokes." Università degli Studi Roma Tre, Rome, Giuseppe Schirripa Spagnolo, *A Journal of Optics*, 9/2004, pp. 869-874.

3. "Whatever features two specimens of handwriting may have in common, they cannot be considered to be of common authorship if they display but a single consistent dissimilarity in any feature which is fundamental to the structure of the handwriting, and whose presence is not capable of reasonable explanation." *Suspect Documents*, Wilson R. Harrison, p. 343.

4. "Repeated small differences establish clearly that two specimens are the work of two individuals despite a great number of general similarities. If there are any basic dissimilarities that cannot be accounted for by a logical, commonsense expla-

nation, then the two writings must have been prepared by different writers." *Scientific Examination of Questioned Documents*, Ordway Hilton, pp. 161-162.

5. "If the conclusion of identity is reached, either in a person or a handwriting, there must not remain significant differences that cannot reasonably be explained." *Questioned Documents*, Albert Osborn, p. 245.

Kay Micklitz is a forensic handwriting and document examiner. She is board certified and court qualified, and has been recognized as a handwriting and questioned documents expert in county, state and federal courts, in both criminal and civil cases. She is a member of and board certified by the National Association of Document Examiners and is a Diplomate of that organization. She holds certificates of completion from the National Questioned Document Association and the American Institute of Applied Science for completion of studies in handwriting and document examination. Kay completed the FBI Citizens Academy in San Antonio in June 2006.

Kay is the owner of Alamo Area Forensic Examiners in San Antonio, where she maintains a private library and laboratory. She is a published author of articles on handwriting and document examination and served five years on the editorial board of the *Journal of the National Association of Document Examiners*.

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How to Identify Documents Produced by a Solid Ink Printer

by

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and

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Abstract: Solid ink printers have steadily increased in market share among printers in the business world over the last few years. The purpose of this research was to examine the unique process and type of ink (solid wax) that is used in solid ink print technology and compare it with other traditional print processes. In addition, this study was conducted to inform the forensic document examiner how to identify images on documents printed with solid ink, as opposed to water-based ink or toner, by using visual and tactile techniques.

Key Words: Questioned document examination, forensic document examination, solid ink printer, solid ink, solid wax ink cubes, water-based ink, laser toner, scratch test, print process identification.



Figure 1. Solid ink printer by Xerox.

Solid ink technology explained

Solid ink printers utilize an ink component consisting of a resin-wax crayon medium in the form of blocks. The solid ink blocks exhibit superior quality over water-based ink or toner powder because the vibrant colors that are produced are close to those that are achieved by off-set printing. Like most newer technologies, solid ink printers were somewhat cost prohibitive when they were first introduced to the market. The cost of a solid ink printer averaged around \$10,000 just a few years ago, but is now selling at prices that are equal to

or less than color laser printers. Because of this affordability, solid ink printers (Figure 1) are attractive for use in a small business or in the home.

With a strong investment in research and development, Xerox was able to improve on the Tektronix solid ink printer to create the new, one pass-through print process that is in use today (Figure 6). Xerox's earliest models of solid ink printers were called Phaser. Their current models of solid ink printers are marketed under the name of ColorQube.

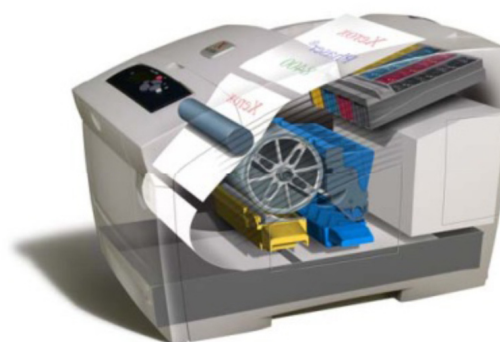


Figure 2. Side View of the Solid Ink Printer. The paper (substrate/document) comes from the bottom of the paper tray, moves upward towards the drum, through the transfix roller and out of the top of the machine.

The innovative solid wax crayon cube (Figure 3) is utilized as the ink source for the solid ink printer. These color blocks remain solid at room temperature and melt on demand as the printer is executing a print job. When melted, a droplet of colored wax is applied onto the paper or substrate and quickly dries. The colors used for the wax crayon cubes are the same as for all printers, specifically cyan, magenta, yellow, and key (black). While these four colors cannot be combined to reproduce every color, they can produce millions of shades of color to varying degrees of density.

The solid ink cubes are easily inserted into the printer by dropping the cube into the designated ink tray. Because the ink is just a solid hunk of colored wax, there are no ink or toner cartridges to handle or dispose of. This feature makes the solid ink printer not only less messy but also environmentally friendly and, according to Xerox, cuts printer waste by 90 percent. (It can take almost a gallon of oil to produce one toner cartridge.) Since there are no plastic ink and toner cartridges, there is the additional bonus of the printer using, throughout its life, 30 percent less energy than a traditional printer, cutting printing costs by as much as 60 percent.



Figure 3. Solid ink cubes easily insert into the ink trays. Color code diagrams under the lid of the printer make the process simple. For the user who is color blind, Xerox has made each colored cube a specific shape that will fit only into its proper slot in the ink tray.

The application process

The application process for solid ink printing is much different from conventional laser or ink jet printers. Solid ink printing incorporates a microscopic layer of silicone oil that is first applied to a heated drum in the printer enabling a quick release of ink from the drum to the paper (Figure 4). The heated rotating drum is integral to the process, eliminating the moving printheads which are common to other print processes.

The solid wax, when melted and jetted through the printheads, is applied in the form of tiny droplets of ink onto the heated rotating drum. The wax partially solidifies before transferring to the paper

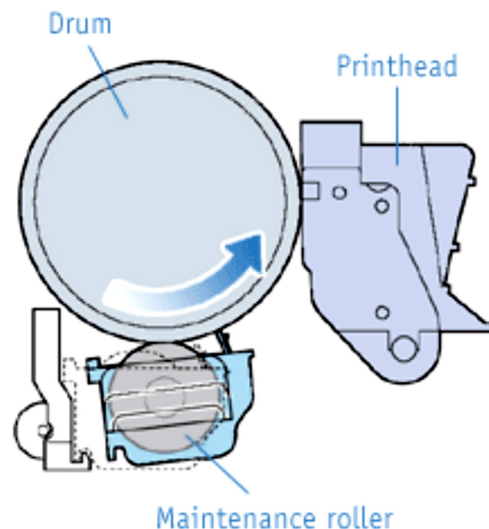


Figure 4. The components inside of a solid ink printer.

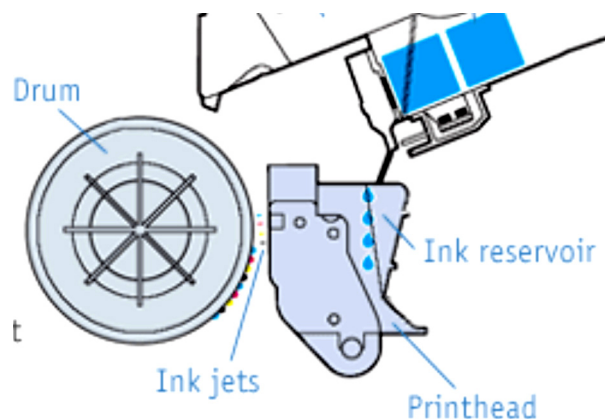


Figure 5. STEP ONE. The printer heats the solid ink cubes until they melt. The melted ink is poured into the ink reservoir. Printheads are located in the ink reservoir compartment. The printheads place small droplets of melted solid wax onto a heated drum.

or substrate where it finishes the solidification process (Figure 5).

The substrate only needs to make one pass through the printer to complete the ink transfer process (Figure 6). With traditional laser printers that utilize toner-based inks, the substrate receives powdered toner from the drum and then the substrate must be passed through a fuser that is composed of two heated rollers. This melts the toner to the substrate. With the solid ink printer, once the ink droplets are transferred from the drum to the paper, the process is complete. No heated roll-

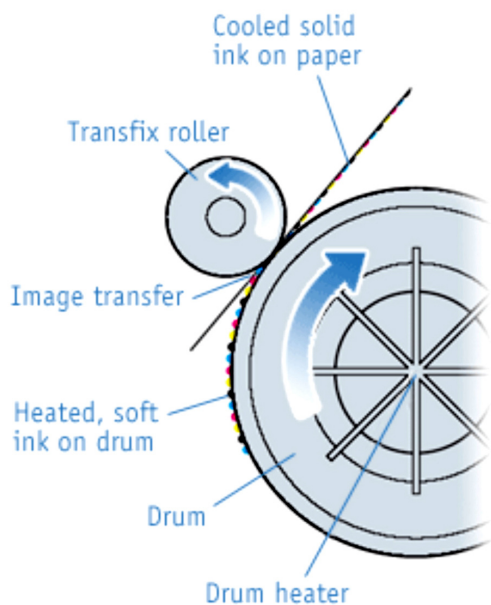


Figure 6. STEP TWO. Only one pass is needed for completion of the transfer. Soft waxy ink droplets are applied to the drum. The paper passes through the drum and a roller then presses the waxy ink droplets onto the document. The ink is dry as the paper exits the printer cavity.

ers are needed to fuse the ink into the fibers of the substrate.

This process is totally different and much more advanced than the original version of the solid ink printer developed in the mid-1980s by Tektronix, a pioneer in solid ink technology. As with ink jet/bubble jet printers, the first solid ink printers used a shuttle printhead as the means for ink application. However, problems of clogged nozzles in the printhead were common. Tektronix was unsuccessful in finding a resolution to this issue, ultimately deciding to slowly phase out the solid ink printer as an unsuccessful experiment. Xerox, on the other hand, saw promise in the product and purchased the solid ink printer technology from Tektronix in 2002. (Xerox is now the exclusive producer.)

Print process identification methods

Using magnification, the identification of an ink-jet-produced document is made when the results show the capillary effect of the water-based ink on the substrate, especially on porous, highly absorbent low-grade paper. The ink “bleeds” into



Figure 7. CAPILLARY EFFECT. A “period” produced on paper by an ink jet printer. Water-based ink from ink jet/bubble printers have a capillary effect. Photo taken with Zarbeco MiScope at 140X.

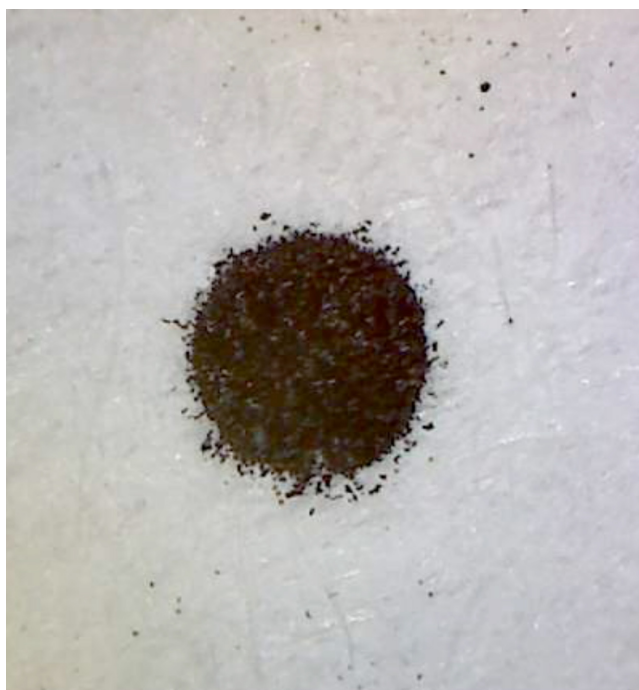


Figure 8. FLECKS OF TONER. A “period” printed on paper from a laser printer. Toner-based laser printers typically leave flecks of powdered toner that fuse to the substrate. These flecks are not normally visible to the reader without magnification. Photo taken with Zarbeco MiScope at 140X.

surrounding paper fibers through capillary action (Figure 7).

Laser printers place powdered toner onto the paper or substrate and heated rollers fuse the toner (which partially consists of fine powdered particles and small amounts of heat-sensitive plastic) onto the substrate. Flecks of toner around each printed character are typically seen on laser-printed documents (Figure 8).

Identifying a solid-ink-printed document as opposed to a laser-printed document may be difficult, especially with text characters. To the unaided eye, both solid ink and laser toner ink leave clean defined lines around the printed characters, and they do not show the capillary effect as observed with ink jet printing. But, once magnified, laser-printed text may show the flecks or dusting of toner around the letters. With documents printed using the solid wax cubes of ink, the text lacks this “dusting” effect. It has the look of wet wax being pressed onto the substrate. Some of the resin-wax medium may slightly migrate beyond the character lines, pos-

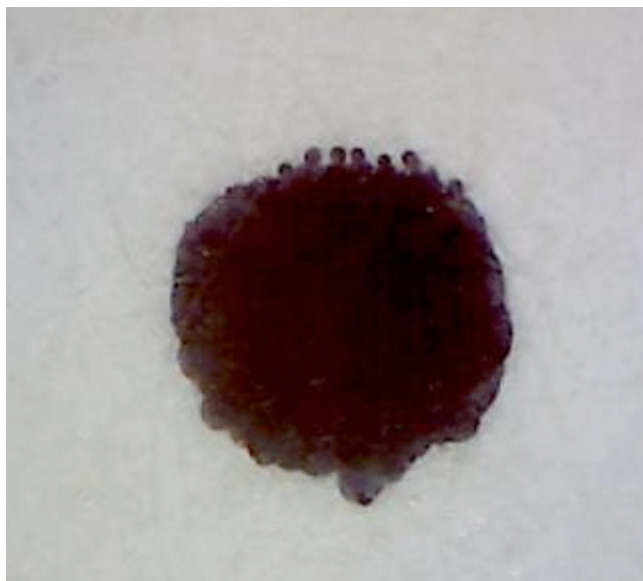


Figure 9. MIGRATION OF INK. A “period” printed on paper from a solid ink printer. Wax-resin based solid ink printers have ink that is semi-dry when it is placed from the printer drum on to the substrate. The wax resin ink is dry as the substrate exits the machine. The migration of the ink is not due to capillary effect, but rather to the transfer process of the semi-solid ink from the printer drum to the substrate. Photo taken with Zarbco MiScope at 140X.

sibly due to the pressure from the transfer process (Figure 9).

Figures 10 and 11 graphically depict the differences between laser toner and solid ink when the inks are fused to the substrate. When compared, the laser toner allows more of the pits and grooves of the substrates to be visible (Figure 10), while the solid ink appears to fill in and fuse with the substrates (Figure 11).

If the document in question is not required for additional testing, such as ink analysis or finger-

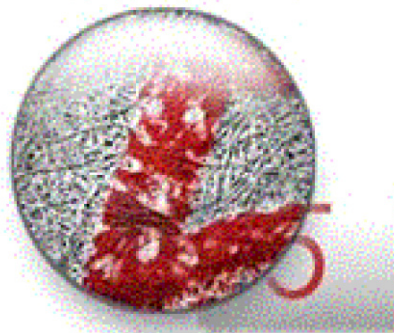


Figure 10. TONER. Under magnification, note that the laser toner fuses on top of the substrate, thus showing the pits and grooves of the texture of the substrate. Figure by permission of Xerox Corporation.

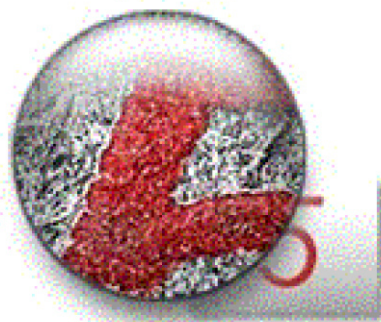


Figure 11. SOLID INK. Under magnification, one can see that the solid ink fuses with the substrate, thus filling in and covering the pits and grooves of the substrate texture. Figure by permission of Xerox Corporation.

print development, the “touch method” may be used to feel for the raised print from the solid ink printing process. If an ink analysis or fingerprint examination must be completed on the questioned document, the touch method should not be used

as transference of fingerprints or other contaminants may occur. The touch method may be more difficult to successfully use if the document was printed on low-quality paper. Inexpensive or recycled papers have increased porosity, allowing them to absorb more ink. If a solid ink document was printed on recycled paper, the ink may absorb more deeply into the fibers of the substrate, thus decreasing the likelihood of one's being able to feel raised printing.

Another test to identify solid ink printing is the scratch test. As in the case of the "touch method," if the document needs to be sent to a laboratory for fingerprint or ink testing, the scratch test should not be performed. This test involves scratching an inconspicuous area of printing with a fingernail or small sharp instrument such as a toothpick. If the document was printed on a solid ink printer, the result will be a sheen that can be detected using grazing or oblique lighting (Figure 12). Since the solid ink contains wax, a shine develops when burnished or scratched. The scratch test will not produce this sheen on water-based, ink jet or laser toner inks.

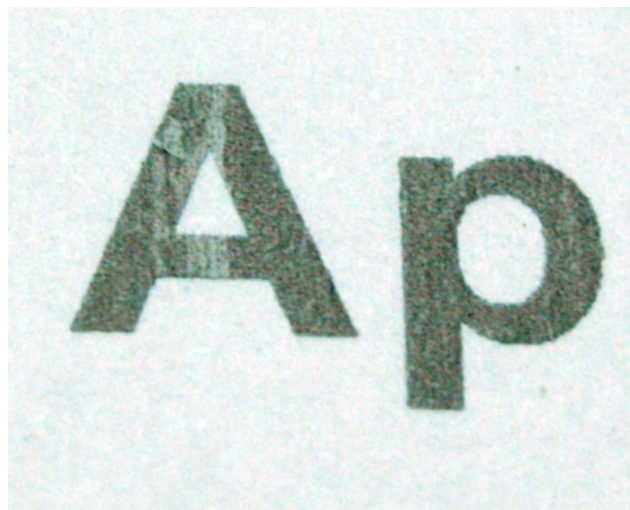


Figure 12. SCRATCH TEST ON SOLID INK. Oblique lighting reveals a sheen or white vertical striated lines appearing on the left half of the capital "A" after applying slight abrasion to the solid ink. For this scratch test result, the abrasion is so slight that it does not remove color pigmentation. This scratch test will not produce a sheen on water-based, ink jet or laser toner inks. Photo taken with Nikon D 100, and oblique lighting.

Due to the waxy nature of solid inks, there are some drawbacks to this technology. If a document was printed on glossy or coated paper, the wax ink may chip or flake when the document is folded. A crayon is a familiar writing/drawing tool that is similar to the wax cubes used in solid ink printers. When a child has left their crayons in a car on a sweltering summer day, it is not unusual to find melted crayons. Documents printed with solid ink are also susceptible to the heat. At times, if solid-ink-printed documents are left in a hot car, the ink may melt. Additionally, the melted ink may cause some documents to adhere to each other. Also, if an attempt is made to thermal laminate a solid ink document, the printed material may melt and smear. These drawbacks may also be helpful to document examiners in making print process identification.

There are other methods, both destructive and non-destructive, available to identify print processes such as solid ink. Most of these methods are usually spectrographic and involve examining the basic components of the ink itself. Spectrographic examinations may use chemicals to break down components of ink (i.e., thin-layer chromatography), burning of the sample (i.e., gas chromatography), or use of infrared (i.e., Raman Spectroscopy or Fourier Transform Infrared). The Raman and Fourier Transform Infrared (FTIR) methods are similar in nature and not usually destructive to the document in question. They both use infrared radiation to break down a substance into its basic chemical makeup.

Figures 13, 14, and 15 depict FTIR printouts of ink jet printer ink, black toner from a laser printer, and solid ink. The printouts show the basic composition of the inks under examination. When tested, the document is placed under the examination stage of the FTIR where a small nipple-shaped probe is pressed into the paper. While not generally destructive, this nipple may put a small dent in the paper. The background material (the paper or substrate) is negated from the examination since papers will contain any number of chemical com-

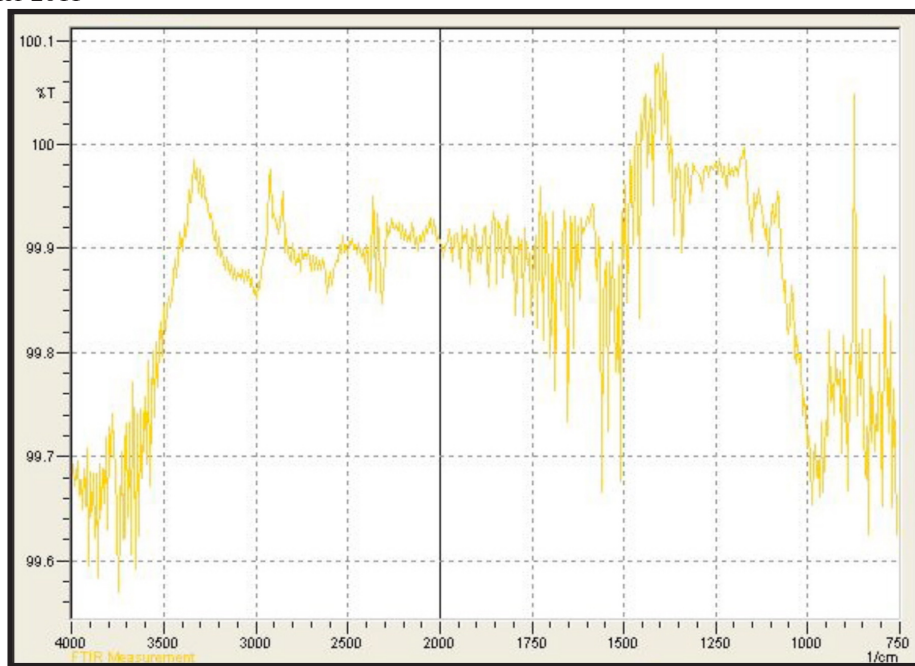


Figure 13. WATER-BASED INK. Results of FTIR testing on water-based ink from an ink jet printer. The horizontal baseline shows type of chemical based on its infrared signature and the vertical shows amount. Analysis courtesy of the Forensic Document Examination Laboratory, East Tennessee State University, Johnson City, TN.

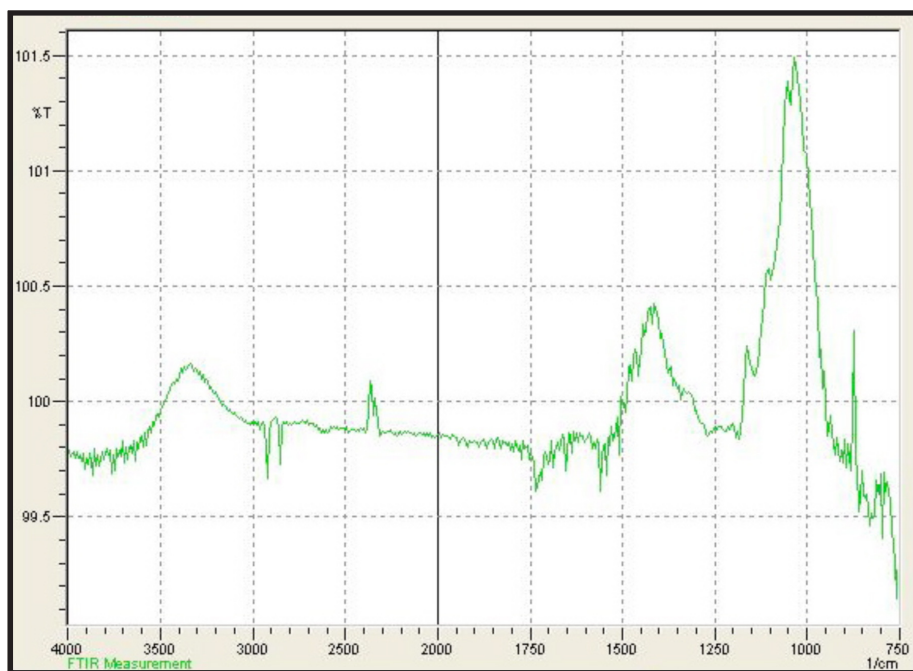


Figure 14. TONER. Results of FTIR testing on black toner from a laser printer. Courtesy of Forensic Document Examination Laboratory, East Tennessee State University, Johnson City, TN.

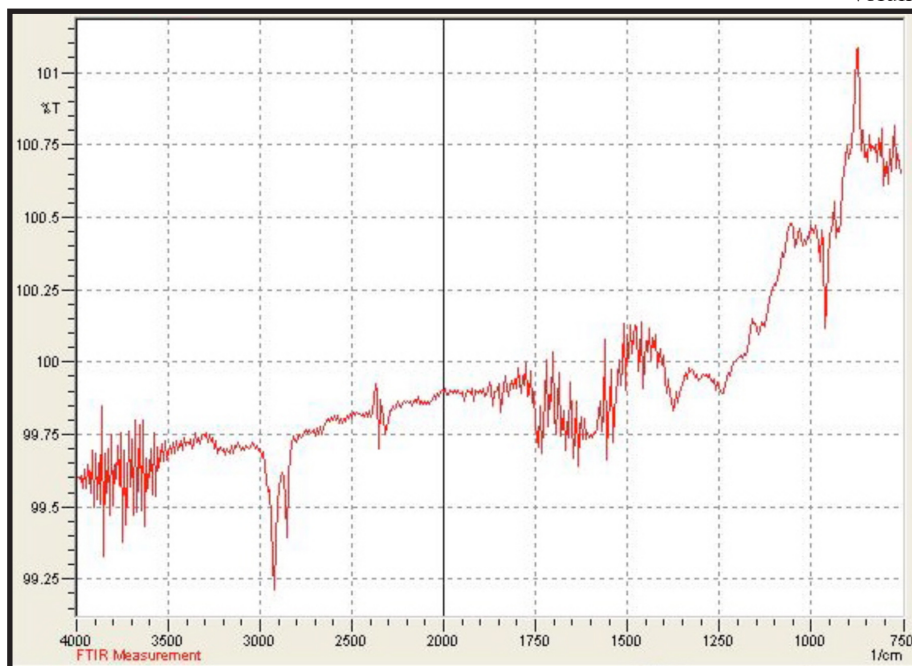


Figure 15. SOLID INK. Results of FTIR testing on wax-based ink from a solid ink printer. Courtesy of the Forensic Document Examination Laboratory, East Tennessee State University, Johnson City, TN.

pounds that would also show up in the FTIR result. This allows just the ink to be analyzed, using FTIR, without interference or contamination from the background material or substrate. The resulting analysis shows types (qualitative) and amounts (quantitative) of hundreds of elements, compounds and chemicals present in the ink sample. A simple visual comparison may be made of the printouts to determine the type of ink (ink jet, solid, laser toner, etc.) or identity of any given ink by manufacturer.

Conclusion

Many large corporations, small businesses and homes are now purchasing solid ink printers because of the sharpness in print quality, ease of use, and lower costs. With the increased use of solid ink printers, forensic document examiners may be called upon to identify and/or differentiate this print process technology. As the present study has indicated, there are proven methods available to the document examiner that will help identify this new print technology.

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She has lectured to large corporations, financial institutions and certified fraud examiners. She has taught the subject of questioned document examination through both the Virginia State Bar Continuing Legal Education and the Virginia Department of Criminal Justice Services.

Ms. Wong was one of four forensic handwriting experts who were officially involved with examining the JonBenét Ramsey ransom note in the *Wolf v. John and Patsy Ramsey* civil case. Additionally, she was retained by novelist John Grisham, Esq., to examine a series of anonymous notes he had received.

She has been interviewed in the *Boulder Daily Camera*, the *New York Post*, *USA Today*, and featured on *Good Morning America*, CNN, Court TV, Fox News' *On the Record with Greta Van Susteren*, and on *The O'Reilly Factor* with Bill O'Reilly.

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Forensic Examination of Paper Fracture Patterns

by

Hannah McFarland, CDE

Abstract: Were a real estate agent's notebook and 14 unattached pages originally joined together? At issue was whether or not a specific group of pages had been torn from the agent's thread-bound notebook. In order to resolve this question, paper fractures, which are edges of paper that have been torn, were studied.

Key Words: Cut paper, forensic sciences, fracture patterns, fracture fit, fracture match, paper fragments, perforations, physical match, questioned documents, torn paper, mechanical fits.

Introduction

A claim was made that a real estate agent failed to notify his client of an important deadline involved in a commercial real estate transaction. As a result of this failure the potential buyer lost his earnest money. The agent provided 14 pages that he claimed were torn out of a thread-bound notebook that he kept as a log. These 14 pages included information showing that he notified his client, the potential buyer, of the deadline in a timely manner. The agent also provided the original notebook from which he claimed that the 14 pages came from.

The commission was to determine if the 14 questioned pages came from the thread-bound notebook.

Materials and methods

A microscopic examination of the paper of the questioned 14 pages and the paper in the notebook indicated that both appeared to be from the same or similar stock notebook. The paper fibers had the same appearance and color. However, the agent could have purchased another notebook of the same brand and model as the notebook at issue and thus obtained the same type of paper to support a claim that the 14 pages came from the agent's notebook.

Logic suggested that if the 14 questioned pages originated from the notebook, then the torn edges of the 14 pages should fit together, like a jigsaw puzzle, the torn edges of the fragments of paper in the thread-bound notebook.

In *Questioned Documents*, Albert S. Osborn encourages experimentation: "As already suggested, every science has its unexplored regions, its fields of speculation, its zones of doubt. It is in these outlying territories that the discoveries are made and into them that progress gradually extends...Much of what is called science is merely accurate classification resulting from intelligent observation and reasoning leading to a correct recognition of similarities and differences."¹

Observations

Study of the 14 individual sheets of the questioned pages showed that they had virtually the same pattern of torn edges, also known as fractures. A possible explanation for this was that when multiple pages are removed from a notebook at the same time, all the pages would be subjected to the same amount of force used at the same identical angle and speed thus creating a very similar fracture pattern among the simultaneously removed consecutive pages. Did the common fracture pattern of the 14 questioned pages indicate that the questioned pages were torn from a notebook at the same time, thus creating virtually the same fracture pattern?

The fracture patterns observed on the remnants of pages remaining in the notebook all had a very different pattern and were not even remotely similar to each other. This seemed to indicate that each page that was removed from the notebook was removed one page at a time.

¹ Osborn, Albert S., *Questioned Documents*, Second Edition, Boyd Printing Company, Albany, NY, 1929, pp. 376, 237.

The next step was to determine if any of the fracture patterns of the notebook remnants matched the fracture patterns of the questioned 14 pages. By doing a careful comparison, it was apparent that none of the page remnants in the notebook shared a common or even similar fracture pattern to the questioned 14 pages.

Lab Testing

In order to determine if multiple pages simultaneously removed share a common fracture pattern, a similar thread-bound notebook as the agent's notebook was obtained for use as an exemplar for testing. A group of 14 consecutive pages were grasped and pulled out of the notebook at the same time. This process was repeated two more times.

Results

Each group of 14 pages that were removed simultaneously from the exemplar notebook shared a virtually identical fracture pattern. Yet each group of 14 pages had a different fracture pattern from the other two groups of 14 pages. This helped to form the opinion.

The following exhibits illustrate the contrast between papers torn separately as shown in Exhibit A, and papers torn together as shown in Exhibit B. A section of Exhibit A and Exhibit B are enlarged in Exhibit C to further illustrate the common fracture patterns in papers torn together and very different fracture patterns in papers torn separately.

Leslie L. Peace indicates that the cellulose fiber distribution and fiber content of each sheet of paper is unique. This accounts for slight variations in the fracture pattern of simultaneously torn multiple sheets of paper.

Other features may be considered in doing this type of examination such as if a notebook has spoilage due to moisture, bleed-through of inks, or other chance marks.

Notebook Construction

Construction of the thread-bound notebook is an important aspect. The thread-bound notebook

was constructed of a stack of 150 pages of paper folded in half and bound by thread in the middle, thus forming 300 half-pages. Each page "remnant" actually represented only half of a piece of paper. Therefore, page one of the notebook was the left half of the same sheet of paper that was folded and its right side was page 300 of the notebook. Thus each page remnant of the questioned notebook had another half of the same sheet of paper that was fully intact.

This notebook construction facilitated determining if consecutive pages were removed. Since the removed pages or "remnants" occurred in the first half of the thread-bound notebook, the other half of the same sheet of paper could be found in the second half of the notebook. Through this process it was determined that the questioned thread-bound notebook only had instances where one page by itself was removed or two pages in a row had been removed. This observation further confirmed that the 14 consecutive questioned pages that were removed all at once could not have come from the thread-bound questioned notebook.

Discussion

A declaration with an attached exhibit was prepared for this case.

There was an arbitration hearing in this case. A document examiner for each side provided a written declaration in lieu of live testimony. The attorney challenging the real estate agent performed a live demonstration at the hearing using an exemplar notebook and removing a group of 14 pages.

Upon reading the declarations and seeing the live demonstration, the arbitrator concluded that the 14 questioned pages did not come from the agent's notebook and ruled accordingly.

Included with this article are Exhibit A, Exhibit B, and Exhibit C. These exhibits illustrate the principles discussed in this article.

Conclusion

This case illustrates that when confronted with an unusual problem, document examiners can per-

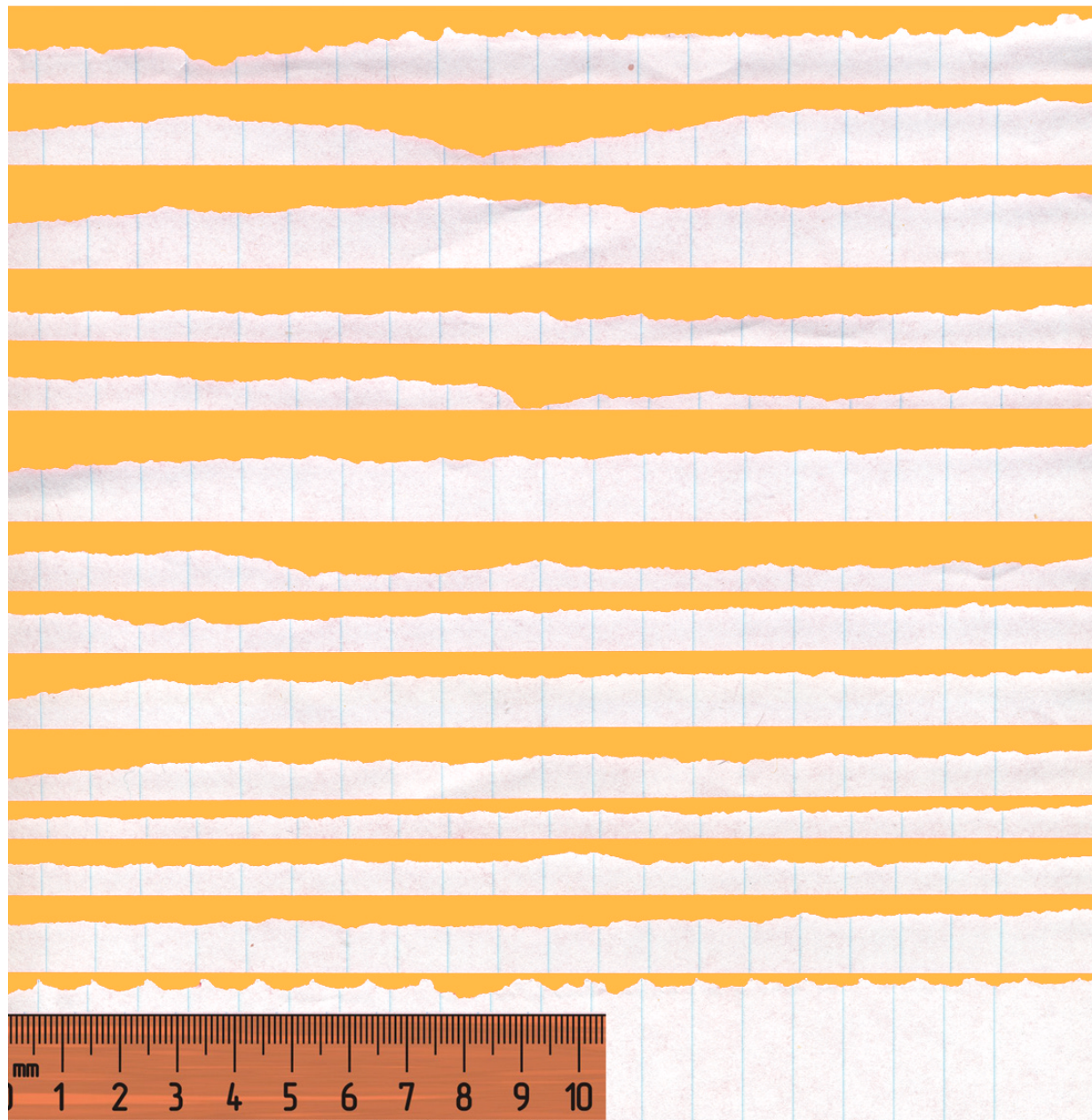
form their own experiments to reveal information useful in forming an opinion that answers a specific question.

Using an exhibit is helpful in demonstrating how the finding was arrived at. The principle behind answering this question lent itself to being illustrated in a live demonstration with the exemplar notebook.

Author's Note

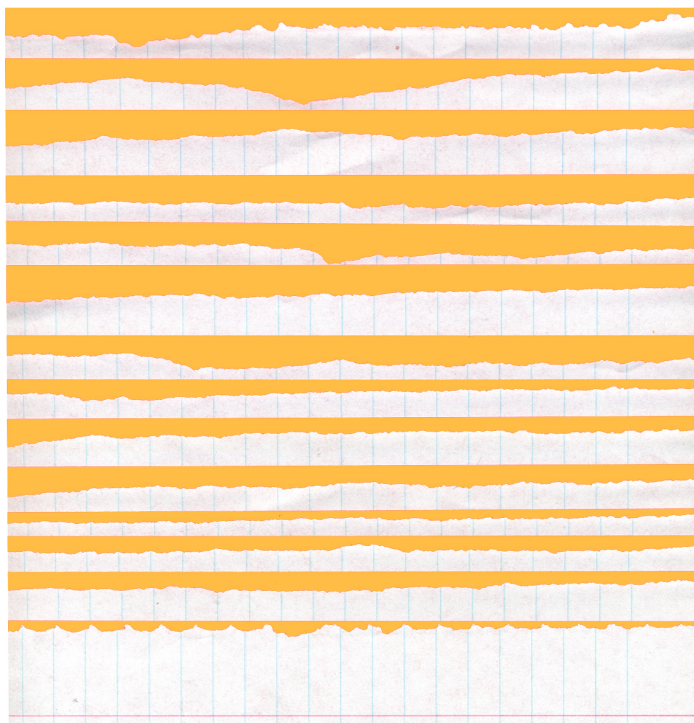
From 2002 to 2005, I taught a one-day class on document examination for The Pan American Institute of Forensic Science and Technology of Monterrey, Mexico. Attendees consisted of many fraud investigators and some lawyers. For the 2005 class, I recreated this case and asked my students to solve it. They quickly and easily did so.

Exhibit A

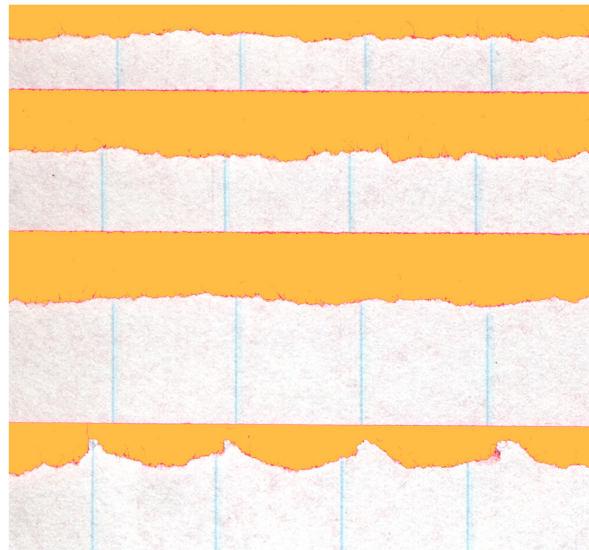


These 14 pages were removed from an exemplar thread-bound notebook, one at a time. Colored paper was placed between the torn pages to facilitate comparison of fractures.

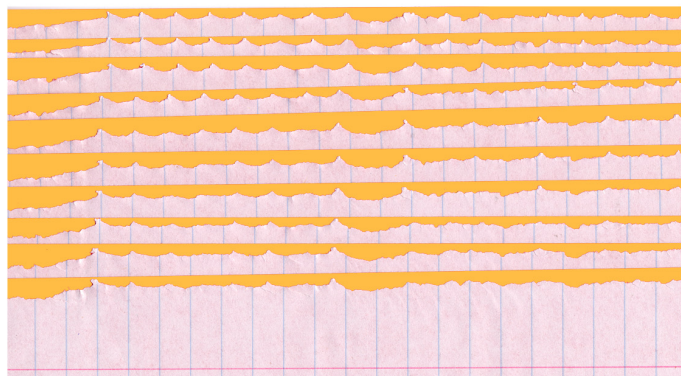
Exhibit B



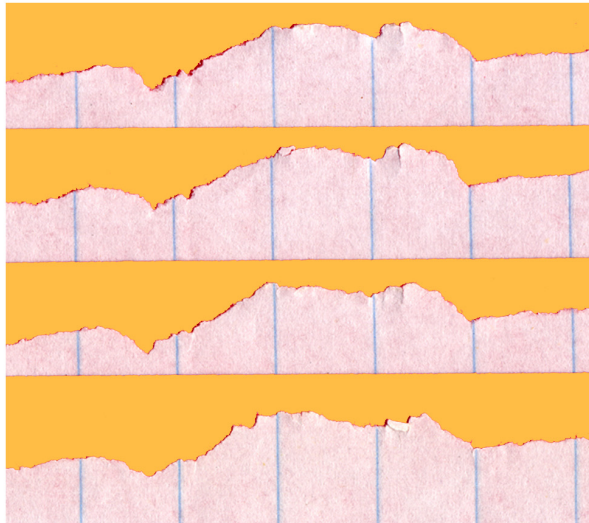
The image above is of the 14 pages removed one at a time. Reproduced at 50%.



The image above is an enlargement of the lower left corner of the image to the left. The fracture patterns are quite different due to each page being removed one at a time. Reproduced at 400%.

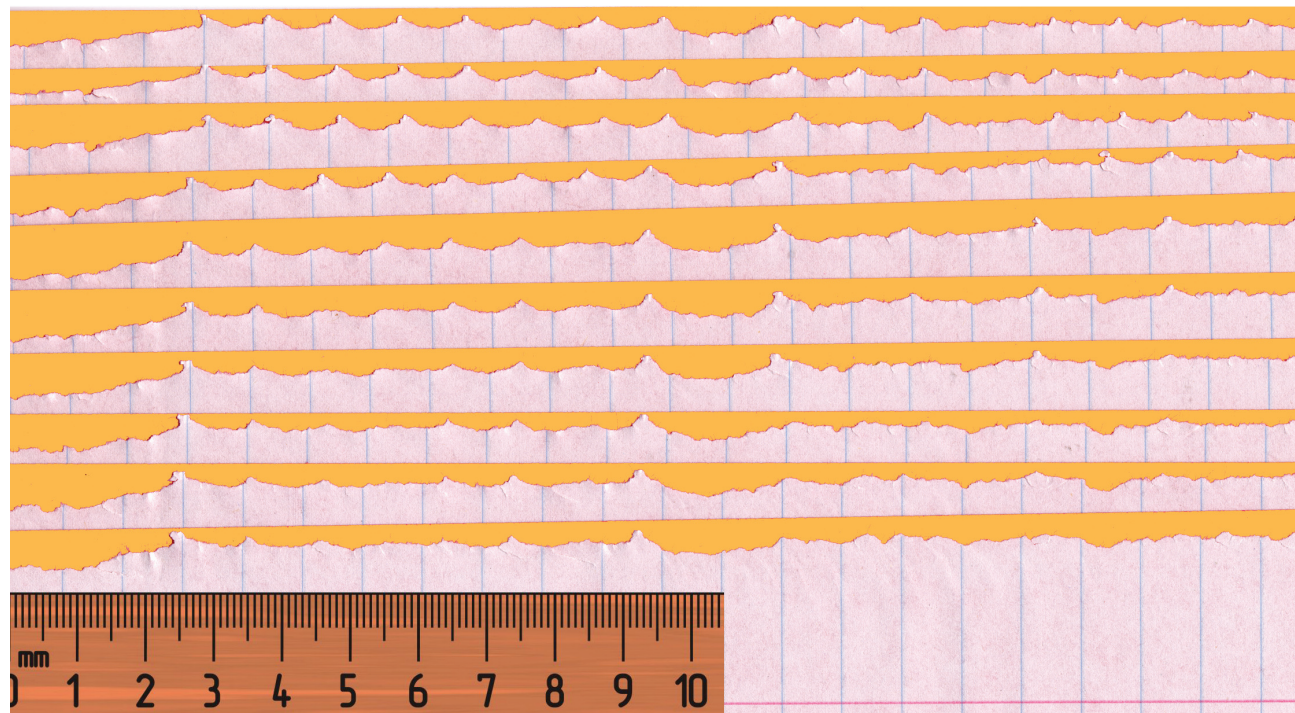


The image above is of the 14 pages removed all at once. Reproduced at 50%.



The image above is an enlargement of the lower left corner of the image to the left. The fracture patterns are very similar due to being removed from the notebook all at once. Reproduced at 400%.

Exhibit C



These 14 pages were removed all at the same time from an exemplar thread-bound notebook. A very similar fracture pattern is common among these torn pages. The slight variations among the fracture patterns is due to the fiber content of each sheet of paper being unique.

Endnotes

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Hannah McFarland, CDE was certified by NADE in 2002 and recertified in 2007. She has testified as an expert witness 48 times in state, federal, and U.S. bankruptcy courts, as well as in other legal proceedings. Ms. McFarland currently serves on the Board of Directors as Secretary of NADE. Previously she served on the NADE board of directors as secretary and membership chair. She has taught document examination for the Pan American Institute of Forensic Science and Technology, Monterrey, Nuevo Leon, Mexico, from 2002 to 2005. Ms. McFarland was a presenter at the 2010 NADE conference in Portland, Oregon.

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Book Review by Shirl Solomon, CDE
Forged, Anonymous and Suspect Documents
by

Captain Arthur J. Quirke, BA

F*orged, Anonymous and Suspect Documents* by Captain Arthur J. Quirke, BA, Handwriting Specialist to the Department of Justice, Irish Free State. (George Routledge & Sons, Ltd., Broadway House, 68-74 Carter Lane, E.C., London, 1930).

Overview

Quirke's approach to evaluating handwriting is multifold. Drawing upon the research of the forefathers of graphology such as Jean-Hippolyte Michon, Jules Crepieux-Jamin, Ludwig Klages and Robert Saudek, his book is predicated upon both the psychology and physiology of handwriting. A few simple handwriting tests remind the reader of some basics, but the author cautions against relying too heavily on the multitude of writing systems for basic standards (rapidly changing and diminishing in our world of electronic messaging).

Since there are so many styles of writing, Quirke postulates that the handwriting analyst reduce the process to two forms, i. e., simplification and amplification, and evaluate from there. The former would involve eliminating initial and terminal strokes and reducing lower and upper zone letters to one stroke. The latter might involve mentally reprocessing flairs and flourishes that distort word meaning.

Relative to the court scene, Quirke stresses that due to the short-term focus and concentration of most juries, the expert should present facts that are readily grasped and retained. That bit of advice is valid even today.

Artificial affectation

According to Quirke, in a writing sample, the presence of the greatest speed and the absence of nonessential curls, swirls and flourishes will indicate the writer's natural characteristics. He postulates that disguised forms seem to betray wider variation in the sloping of a particular letter.

Consistent terminology

For my edification, I mention the few terms here that I tend to forget, or never employed. Perhaps document examiners no longer use these terms or never did. (This book was copyrighted 1930.)

- Eyelet: A tiny loop, often involuntary, frequently seen in the lowercase "o," "a" and "d."
- Foot: The lower portion of a downstroke that ends on the baseline.
- Hiatus: Failure to complete the junction between two letters without lifting the pen.
- Spur: Short horizontal terminal stroke as in "b," "v" and "w."
- Staff: The long downstroke that forms the backbone of a letter, as in the lowercase "p."
- Trough: Any garland form in the body of a letter, such as in "u" and "w."
- Troughbed: Concave on the upper aspect of a letter.
- Undercut: A connection that follows an oval letter, where the line is brought in beneath the oval and circles it to avoid reversing the motion. (I see this often.)

A practical scheme

This chapter was meant for the novice and is well outlined in terms of a detailed system for examining and evaluating documents, keeping an account of the findings and using some of the information in a report that includes the document examiner's opinion. Most of the information gleaned would be considered as "Work Product" and not available in "Discovery." The procedures offered entail a lot of work and documentation. Still, they may be valuable exercises. The author lists from 95 to 110 variants of all the lowercase letters in the alphabet. I found the most interesting were the "o"

and the “t.” These pages alone are a worthy reference when examining handwriting samples that are illegible due to the distortion of letters in the alphabet. Quirke does not devote pages to capital letters, arguing that they do not occur frequently enough to aid in the determination of authorship. With this I disagree, and would like to have seen examples of these capitals, both exaggerated with flourishes and also simplified.

The author opines that it is not so difficult a task to determine the author of block-letter writing. Quirke says one need merely compare the block letters to the script capitals of a suspect. He cites the case of a woman suspected of producing and sending block-letter, threatening notices. Altogether, there appeared hundreds of the block letter “O” in the spurious notices. These were compared with standards of cursive writing provided by the suspect. A curious phenomenon was observed. At the three o’clock position of the lowercase “o,” the pen stopped and continued with a horizontal stroke to the next letter, leaving a gap between 12 and 3 o’clock.

Quirke attributes this peculiarity to a physiological cause, specifically a lack of coordination in the writing hand, rendering the author unable to produce the full upward movement. When a writer with this condition attempts to form lowercase circle letters as block letters, telltale bulges may appear. The use of the microscope, referred to in the chapter that follows, is indispensable in detecting such bulges.

The ensuing chapters focus on the use of the camera and microscope to examine ink and paper. It was immediately evident that the equipment, as described by the author, was from another time and would not be applicable to the handwriting expertise of today. He offers methods for determining the type of paper and ink that were used for a document, describing some procedures which are destructive and best avoided by the document examiner. Also touched upon were typesetters and lithographs used to create unauthorized posters, forged works of art, and illegal documents.

The chapter on writing inks would only be compelling to the historian, since in Quirke’s day, pre-World War II, there existed no ballpoints and none of the mass-produced practical, throw-away pens or the inks monopolizing the market today. However, for those interested in how historic documents and famous signatures were forged, this chapter is quite detailed regarding the chemical composition of inks, in all colors, as well as the type of ink made to disappear. It was interesting to learn that ink oxidizes gradually and becomes less soluble with age, indicating that extraction and analysis of inks is increasingly difficult as the years pass. As writing in pencil was commonplace in Quirke’s time, it was important to be aware that it was easier to obliterate ink from graphite writing than to obliterate graphite written over an ink rendering. (Interesting, but not relevant to document examiners who do not engage in anything destructive to a document.) Writing with animal secretions and similar secretions jarred me from dozing off. This occurrence was frequent in prisons. Quirke recalls visiting a cell while the inmate was at exercise. Quirke was attracted to the tube of toothpaste, which did not seem to fit the prisoner’s toothless smile. The toothpaste was inspected and it was found to contain ingredients which the prisoner used to simulate ink. The paper would be dampened, then the writing imposed on the paper. When the paper dried, the writing became invisible and did not surface into visibility until the paper was dampened again. I also skimmed over the chapter on carbon sheets (long since replaced by chemical copies), blotting paper (not necessary with the fast-drying inks of today) and typewriters (what are they????). It is too bad that blotters and carbon paper are obsolete; they must have provided a wonderful source of evidence.

Police investigations

It seems that in Quirke’s time, as well as in Saudek’s and William E. Hagan’s time, as handwriting specialists they frequently experienced the so-called victim who sent disguised letters of threat to themselves. Quirke explains that the mo-

tives stem from grudges against others, an attempt to get police protection for fear of molestation, a plea for attention, or a set-up for a future arson on their property for the purpose of collecting insurance. The number one person to turn to in such cases is, of course, the handwriting examiner, who may quickly determine if the writing is disguised, and possibly without the need to refer to any other document for comparison. Though gender cannot readily be determined from the handwriting, certain psychological and physical conditions may be indicated. Such conditions as alcoholism, dementia, Parkinson's, muscular disorders and palsy may be discernible.

While his speculation may not be true today, Quirke suggests that the author of a threatening letter generally does not reside more than a few miles away from the person receiving it. The obvious next step is to secure sample writings from suspects. Still, Quirke avers that handwriting identification takes a secondary place to fingerprinting evidence. If fingerprints are lost or blurred or the author wore gloves while handling the paper, envelope and stamp, then there is another ally: the mail carrier. He/she is generally familiar with the envelope information in their district and the frequency with which particular letters are included in their mail delivery. With regard to drawing conclusions from the spelling, Quirke quotes Dr. Hans Gross, professor of criminology at Prague University, and author of the famous classic *Criminal Investigation*: "As to the spelling...it proves absolutely nothing. The forger may know how to spell and intentionally introduce mistakes...or he may not know how to spell, but get help with spelling in the forged letter...a person who cannot spell observes no rules of grammar...ergo, the one rule that can be deduced is that the majority of uneducated or ill-educated people follow no law in spelling or grammar. The educated man who exhibits a misspelling, if done on purpose, will not misspell in the requested writing. If he is unsure of the spelling, he will tend to replace the word with one he knows is correctly spelled."

Quirke exhibits a sense of humor in offering his legal (though purposely faulty) definition of expert evidence: "Expert evidence is the subjective interpretation under oath of the collective value of a number of purely objective scientific facts." This following quote from Quirke is truer and hit home for me, despite its wordiness:

"From what has been said, it is clear that there is one further mental attribute which the handwriting analyst, and indeed every expert witness, must possess if the dangers of the present methods of admitting expert testimony are to be obviated or minimized. If the machinery of justice insists that such a witness should deliver himself of a verdict (however emasculated of executive effect) the machinery of justice should, for its own credit, ensure that every witness so heard possess that gift, natural or acquired, which enables him to weigh and evaluate data, pro and con, and then strike a balance between both with absolute impartiality, utter detachment and a nicety worthy of an instrument of precision."

(I haven't quite figured out what this means, but it certainly conjures up a sense of pride in the work we do.)

Recommendation

In the last 30 to 40 pages, the author devotes much time and redundancy to police procedures relating to crime and to the ethics of the court, jury, attorneys and expert witnesses. For me, this became tiresome. Still, I do recommend this book because it has so much to commend it. It offers the handwriting analyst/expert some worthy if simplistic methods of procedures to follow in evaluating documents. I know I will in the future take the opportunity to refer to the 26 pages that demonstrate the various ways of writing the lowercase letters of the alphabet, some of which triggered a memory of forms I had seen before and not been able to decode.

In short, the book is sincere in every intention, well written, and offers much information in an easy-to-read format.

Shirl Solomon, CDE, Diplomate has practiced forensic document examination from her office/lab in Florida for the past 30 years. She has been retained by more than 330 attorneys, testified in federal, state and county courts in over 60 criminal and civil cases, and prides herself in never having been disqualified from testifying.

A certified member of NADE since 1992, Shirl was awarded Diplomate status in 2005.

Shirl has spent many years researching the handwriting of young people in programs approved and supported by schools ranging from Montessori School toddlers to college students. A Freudian, believing that “the child is father of the man,” her research continued with court-approved projects to help determine the public safety factor of about-to-be-released inmates.

Knowing Your Child Through His Handwriting and Drawing (Crown Publishers) was nominated for the Janusz Korczak Award, a literary prize given for advancement in child research. The foreign rights to another book of Shirl’s was translated into German, Italian and French. It was the French edition of *Scryptics* which led a San Francisco computer marketing firm to adapt *Scryptix* (renamed) into an iPhone App. Shirl is now studying Hebrew and considering a Hebrew language adaptation.

Ten years past retirement age, a modest assessment according to Shirl, she continues to pursue handwriting research in the study of new languages. She has to, she says, “or what’s a brain for?”

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Book Review by Reed Hayes, CDE
Disputed Documents: New Methods for Examining Questioned Documents
by
Hanna F. Sulner

Disputed Documents: New Methods for Examining Questioned Documents by Hanna F. Sulner (Oceana Publications, Dobbs Ferry, NY, 1966, 386pp).

Hanna F. Sulner (1918-1999) received her training as a forensic document examiner in Europe, having studied and practiced with her father, Professor Julius Fischhof, who was recognized as the leading document and handwriting expert in Eastern Europe during the 19th century. She studied criminology in Budapest and in Germany and received a special degree qualifying her to teach the subject of questioned documents at the law school of the University of Budapest. She took over her father's practice after his death in 1944 and quickly inherited his reputation as a meticulous professional. In 1945, Mrs. Sulner became an official document expert in temporary status to the courts of Hungary after passing a comprehensive examination required by the Hungarian Ministry of Justice. In 1948, after three years of satisfactory service and pursuant to the regulations of the Ministry of Justice, she received a permanent appointment as an official document expert to the courts of Hungary and testified in court on a regular basis. She held this position until 1949, when she left Communist-controlled Hungary and fled to the West with the aid of American and British intelligence agencies.

In 1950, Hanna Sulner immigrated to the United States with her infant son and promptly resumed her career as an examiner of questioned documents. From 1950 until her death in 1999, she practiced in New York, testifying in civil and criminal cases in various state and federal courts. She was retained as an expert on handwriting and document-related issues by the United Nations, the United States Government, the governments of Mexico, Brazil and Venezuela, the New York



Hanna F. Sulner

City Law Department, various district attorneys, the nation's leading banks, insurance companies and corporations, and many prominent attorneys and law firms throughout the United States.

Her professional publications appeared in scientific and legal journals in Europe as well as in such noted American publications as *Law and Order* (a professional periodical for law enforcement agencies), the *ABA Journal*, *Trauma* (a medical-legal publication), *Criminal Law Review*, and various other legal journals and periodicals.

Mrs. Sulner lectured on the subject of document examination to various state and county bar associations throughout the United States and testified in more than 1,000 cases during the course of her lifetime. She became one of the nation's most respected and sought-after document examiners, and was famous for insisting on high-quality, precisely lit photographs of handwritings for her detailed analyses. Hanna F. Sulner died in Manhattan in 1999, survived by her son, Andrew Sulner, a forensic document examiner and attorney, to whom she dedicated her book.

Hanna Sulner's book, *Disputed Documents*, is designed as a reference tool for attorneys and others who are likely to come into contact with suspect documents. In her chapter on "Fundamentals of the Questioned Document Expert's Practice," she proffers the importance of a preliminary examination of the document in question to ascertain whether the investigation should be taken to a higher level. She stresses the danger of off-hand opinions and the need for thorough study of the material before reaching a conclusion. Her "Logical Progress of Inquiry" includes:

1. Ascertaining the facts (essentially, determining exactly what is questioned and whether the comparison standards are acceptable).
2. Analysis of the details (alleged writing circumstances, date of the document, etc.).
3. Qualification of the case (anticipated time frame for the examination, whether the original is available, and if "photo-enlargements" should be made).

This chapter also covers the care of documents while in the examiner's possession, the importance of proper comparison material, and how to take request exemplars in court.

Chapter 3 of Sulner's book deals with the tools of the trade including magnifiers, microscopes and ultraviolet lighting. The section about microscopes is especially detailed with respect to devices available in the mid-1960s, providing a basis for examiners' work with the more modern equipment available today. Sulner states a "proper" presentation of an enlarged signature or passage of type-writing should include the entire signature or passage. In her opinion, demonstrating isolated letters is apt to be misleading to the trier of fact and she therefore considers it improper to do so.

Sulner's "Identification of Handwriting" chapter is quite substantial. It includes a "Key to Proper Identification" wherein she discusses the basic traits of genuine writing and the difference between similarity and identity. She stresses that the exis-

tence of similarities between two sets of writings does not necessarily mean they were produced by the same person. She warns, "Comparison based upon 'similarity' can be fatal to any conclusion." Also discussed in this chapter are disguised writing and some of the methods utilized in attempts at disguise. Sulner notes that identification of a writer involves discovering a sufficient number of identical writing habits and identical "controlling characteristics" in addition to the absence of divergent characteristics, whereas elimination entails finding a sufficient number of divergent features and the absence of similar ones.

In this chapter, Sulner describes and illustrates the "Fischhof Method" of writing comparison introduced and utilized by her father. Professor Fischhof's method was to turn the questioned and known signatures upside down, thereby affording the examiner a more objective view of the material by making it easier to note handwriting features while avoiding the natural tendency to read words and letters.

Chapter 5 also includes summaries of several of Sulner's actual cases, some of them accompanied by useful illustrations.

In Chapter 6, Sulner discusses brain function and its involvement in the writing process. She writes extensively about mental disorders and their effect on handwriting, stating with certainty that "One's mental state will modify the way one writes." She claims that a person's lack of testamentary capacity can be deduced from his writing and/or signature and she provides examples of writing reflecting "impaired mental incapacity." Sulner's list of "some of" the handwriting abnormalities indicating mental disease or mental or emotional disturbance may be open to discussion, particularly considering advancements in the mental health field since her book was published. (See sidebar on page 40.)

Sulner follows her list with a warning that no one of these signs proves lack of testamentary capacity, but all must be weighed and evaluated with the

**Sulner's Indications
of Mental Disease or Emotional Disturbance***

1. Repetition of letters in a word or signature.
2. Repetition of words or several words in a text.
3. Complete or partial omission of letters or words in a text.
4. Transposition of letters.
5. Incorrect spelling or correct spelling with confusion in the text.
6. Undecipherable words or letters or "just plain scribbling" in otherwise legible text.
7. Indications of lack of control of the writing instrument at times in otherwise controlled writing.
8. Many unnecessary, meaningless curves, strokes, loops or unusual ornaments.
9. Interruptions between letters, mainly when the letters themselves are broken.
10. Trembling, wavering lines or jerkiness.
11. Unusually large writing with letters increasing in size.

*NOTE: Sulner warns that no one of these indicators should be relied upon in determining lack of testamentary capacity, but that all evidence must be considered.

available evidence. She defines "insanity" and "incompetence," terms that perhaps should have been left to legal and medical authorities. She suggests the handwriting expert cannot distinguish between one mental disorder and another, but reiterates that lack of testamentary capacity at the time of writing can be discerned.

The author also discusses alcoholism in this chapter, giving detailed information about its effects on the nervous system and providing material about the stages of intoxication and various degrees of alcoholism. However, the only cited reference material related to this topic is an article by Richard Stoller, M.D., published in 1960.

Numerous examples of alcoholics' handwritings, provided by medical doctors specialized in the treatment of alcoholism, are included in Sulner's book, but unfortunately, no samples are

identified as having been written before, during or after intoxication, which would have afforded a more meaningful look at how alcohol might affect an individual's writing. Several deteriorated handwritings are given as illustrations of extreme alcohol abuse and diminished testamentary capacity. Sulner cites a number of court cases in which alcoholism played a role, including cases where evidence was offered to prove intoxication or sobriety at the time a given writing was executed.

Various mental and/or emotional disorders (including hysteria, paranoia, and schizophrenia) are briefly addressed and Sulner considers how such maladies might relate to the person's testamentary competence. Several handwriting samples illustrating senility are provided. (The disorders discussed might have different or more thorough explanations nowadays, given the medical and technological advancements since the text was written. For example, senility might now be referred to as Alzheimer's disease.)

In addition to several of her own case histories where she found mental or emotional disturbances to be evident in handwriting, Sulner presents numerous summaries of court cases where handwriting experts have rendered testimony as to a writer's impaired mental condition. This would certainly prove useful to any handwriting examiner attempting to show evidence of a person's diminished mental state at the time of writing.

In her chapter on the examination and identification of typewritten documents, Sulner lists a total of 11 possible questions concerning typewriting. She thoroughly discusses components of typewriters and provides extensive information about conventional versus proportional spacing. More significantly, she speaks of the characteristics one ought to rely upon in working questioned typewriting cases.

Chapter 8 deals with techniques of paper examination. Sulner provides some history of paper making and writes about the composition of various types of paper. She addresses watermarks,

paper finishes, brightness, thickness, porosity, opacity and color of paper, and also considers matching of torn or cut paper edges. Additionally, this section contains useful material on determining the sequence of handwriting or typewriting by examining folds in paper. She makes an important point that when paper is folded, the fibers are damaged (sometimes actually fractured), which is why a folded page can never be restored to its original condition. Sulner notes that damage to the paper fibers also facilitates determining whether a passage of writing or a fold was created first.

Sulner thoroughly discusses various types of ink, their composition, and the general time periods of their manufacture. Ink removal agents are also addressed, as are chemical tests for determining ink differences. The author touches upon microscopic examination of ink as possibly providing information regarding line sequence “if the conditions are such that it can be determined.” She also illustrates detection of erased ink residue by using ultraviolet lighting.

In the next chapter, the author deals with lead pencils, variations of pencil writing, and determining sequence of crossed pencil lines, crossed pencil and ink writing, and crossed pencil and typewriting. Detection of pencil erasures and alterations are also addressed, using microscopy, ultraviolet examination, and side-lighting.

Chapter 11 of Sulner’s book covers secret writing and codes, reconstruction and restoration of documents, and examination of rubber stamp impressions. The latter topic includes information regarding the detection of whether a rubber stamp impression was placed on a document before or after any written material. Also, Sulner briefly writes about deciphering text from imprints or impressions of writing, primarily by using oblique lighting.

The final three chapters of the book deal with expert testimony. Chapter 12 focuses on evidence, the preponderance of evidence, and whether evidence meets the burden of proof. Evidence to

make a *prima facie* case is described as sufficient to maintain a party’s position without being contradicted or otherwise explained by the opposition. Sulner discusses how evidence may be used to create a reasonable doubt in the mind of the trier of fact and how it can be utilized to refute the opposing expert’s opinion. Regarding the importance of impartiality, she recounts the famous Dreyfus case of 1894 in which anti-Semitism, the influence of the French General Staff, and Alphonse Bertillon’s testimony sent an innocent man to prison. Her emphasis is that experts must always maintain objectivity.

Chapter 13 goes into detail about how attorneys might qualify an expert on direct examination, as well as suggestions for challenging the opposing expert’s qualifications. Lengthy excerpts from transcripts of Sulner’s courtroom testimony and cross-examination of opposing experts are provided to illustrate both direct- and cross-examination techniques.

Sulner’s final chapter, entitled “Important Basic Rules in Questioned Document Cases,” is essentially a list of 10 items that she calls “The Ten Commandments of the Questioned Document Expert’s Practice.” These items cover ethics and professionalism in handling cases, interacting with clients, and demonstrating opinions in court, all important guidelines for forensic handwriting and document experts.

Hanna Sulner’s book is a valuable contribution to the field of handwriting and document examination. However, readers must keep in mind that since the book’s publication in 1966, significant advances have been made with respect to the equipment and technology used by document examiners. Also, numerous updated research studies dealing with the effects of certain pathologies on handwriting can now be found in professional journals and online sources.

Reed Hayes, CDE operates a handwriting and document examination business in Honolulu, Hawaii. He has studied handwriting for over four decades and has worked internationally as a handwriting expert, including acting as a consultant for the book and video production of *The Diary of Jack the Ripper* (Smith Gryphon Publishers, London, 1993).

Mr. Hayes is a graduate of the Andrew Bradley Training Courses in Forensic Document Examination (beginning and advanced) and holds a certificate of training from the American Institute of Applied Science. He received certification from the National Association of Document Examiners in 2001 and was re-certified by NADE in 2006 and again in 2011. He has testified in numerous trials in the state of Hawaii and in Guam.

He is the author and co-author of several books, including *Forensic Handwriting Examination: A Definitive Guide*, as well as several articles published in peer-reviewed journals. As a frequent lecturer about forensic handwriting work, Mr. Hayes was a presenter at the 2001 NADE conference in Crawley (London), England, and the 2002 NADE conference in Ann Arbor, Michigan.

Mr. Hayes teaches a *Training Course in Questioned Handwriting and Document Examination* to students in the U.S. and abroad. He serves on NADE's editorial board and is responsible for the layout and typesetting of this issue of the journal.

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2012 NADE Journal Submission Guidelines

A. Types of Papers Accepted:

Papers must present information or viewpoints regarding some aspect of QDE which would be of value to readers.

1. Research papers that report original research regarding any aspect of Questioned Document Examination (QDE) or in a related area of interest. Research papers must include an abstract and full bibliography. They must begin with a statement of purpose and end with a statement of findings.
2. Annotated bibliographies that survey the published literature on a specific topic in the field of QDE.
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5. Letters to the Editor that offer brief, specific comment on a current issue or on a paper previously published in the journal.
6. OpEd (Opinion/Education) / Commentary pieces that set forth an opinion, pose a question, or inform about some aspect of QDE.
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B. How to Submit your Paper/Abstract:

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4. Assign a figure number to each image.
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Instead, select what you want to center and choose "Center Text" from the formatting tools.

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